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HISTORY *of* COLORADO

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CHAPTER VIII

THE SETTLEMENT OF COLORADO

Colin B. Goodykoontz

TRADING POSTS AND GOVERNMENT FORTS—MEXICAN LAND GRANTS AND SETTLEMENTS—THE GOLD SEEKERS—CHERRY CREEK "CITIES"—EARLY MINING CAMPS—EARLY COUNTIES—RAILROAD LANDS—THE AGRICULTURAL COLONIES—TOWN DEVELOPMENT COMPANIES—SAN JUAN MINES—SAN LUIS VALLEY—LEADVILLE—RAILROAD CONSTRUCTION—NEW COUNTIES—THE WESTERN SLOPE—THE "RAINBELT"—INDUSTRIAL DEVELOPMENT—THE "MOFFAT COUNTRY"—CREEDE AND CRIPPLE CREEK—MINING DEPRESSION—DISTRIBUTION OF POPULATION—THE PASSING OF THE FRONTIER.

Although the Pikes Peak country was an unorganized Indian territory¹ when the goldseekers came in 1858, it was not devoid of white inhabitants and its main physical features had been made known already through the efforts of scores of trappers, traders and explorers. Important as were the contributions to geographical knowledge made by such official explorers as Pike, Long, Frémont and Gunnison, and by such travelers as Parkman and Ruxton, the fur traders and trappers were the real pathfinders.

For twenty years the most famous trading post within the limits of Colorado was Fort William or, as it was more frequently named, Bent's Fort. It was completed in 1832 on the Arkansas River at a site about twelve miles above the present town of Las Animas. Here the trappers and

¹ By treaty made in 1851 the region along the eastern base of the mountains between the Oregon and Santa Fé trails was reserved for the Arapahoe and Cheyenne Indians. In 1854 the western boundaries of Kansas and Nebraska territories were put at the Rocky Mountains but neither had actual jurisdiction over the Pikes Peak country in 1858.

Indians came with their furs, and annually valuable consignments of pelts were sent to St. Louis.² In 1852 William Bent, angry because of delay in his negotiations for the sale of the post to the Federal Government, set fire to it and then built a new post farther down the Arkansas Valley, near the present boundary line between Bent and Prowers counties.³ In 1859 "Bent's New Fort" was sold to the Government, and its name was changed to Fort Wise, in honor of Governor Henry A. Wise of Virginia.⁴ Other important trading posts of the early days were Fort Lupton, Fort St. Vrain, and Fort Vasquez, situated on the South Platte between Denver and Greeley.⁵ These were established between 1836 and 1838.

At the junction of the Fountain and the Arkansas was a place designed by Nature for the location of a trading post or a town, and here or in the vicinity several ephemeral posts were established in the early days. For a description of one of these settlements we are indebted to Rufus Sage, who wrote:

At the delta, formed by the junction of the Fountaine qui Bouit with the Arkansas, a trading fort, called the Pueblo, was built during the summer of 1842. This post is owned by a company of independent traders, on the common property system; and, from its situation, can command a profitable trade with both Mexicans and Indians. Its occupants number ten or twelve Americans, most of whom are married to Mexican women, while everything about the establishment wears the aspect of neatness and comfort.⁶

In and around the Pueblo was to be found a roving group of American and Mexican trappers, who also engaged

² Charles Christy, "Personal Memoirs," in *The Trail*, I, 21-22.

³ Hall, *History of Colorado*, I, 164.

⁴ In 1861, after the secession of Virginia, the name of Fort Wise was changed to Fort Lyon in commemoration of the valiant services of General Nathaniel Lyon, who lost his life in the engagement at Wilson's Creek, Missouri, August 10, 1861. In 1867, after a flood in the Arkansas Valley, Fort Lyon was moved up the river about twenty-five miles. Near the new site of the fort the town of Las Animas grew up.

⁵ Sage, *Rocky Mountain Life*, 212; Hafen, "The Early Fur Trade Posts on the South Platte," in *Mississippi Valley Historical Review*, XII, 334-341.

⁶ Sage, *op. cit.*, 222.

in farming on a small scale. They led a lazy life, hunting deer and buffalo to keep themselves supplied with food. But from 1854, when all the inhabitants of the Pueblo were killed by the Ute Indians, until the gold rush, no one, apparently, lived at the mouth of the Fountain.⁷

In 1858 the Federal Government had one fort within the present limits of Colorado. As a means of protection against Indians, Fort Massachusetts was built in 1852 in the San Luis Valley, about six miles north of the site of Fort Garland, by which it was replaced in 1858. There was need for a fort in this valley in order that the Mexican farmers, by whom it had been inhabited for some years, might be protected. The San Luis Valley was historically a part of New Mexico and was so administered until 1861.⁸ Here, as well as on the eastern side of the Sangre de Cristo range, generous land grants were made by the Mexican authorities while this region was still under their jurisdiction. In 1842 a considerable part of the present Conejos County, Colorado, was granted to José and Antonio Martinez, Julian Gallegos, and Seledon Valdez as a reward for their faithful services to the state. In 1843 a vast tract of land on the east bank of the Rio Grande, in Costilla County, was granted to Luis Lee and Narciso Beaubien. Here, on what was known as the Sangre de Cristo grant, Carlos Beaubien, heir of Narciso, planted a colony in 1849 about one-half mile south of the present boundary line between Colorado and New Mexico. In 1851 a Mexican settlement was made near the present town of San Luis; in 1852 and 1853 respectively San Pedro on the Trinchera and San Acacio were founded.⁹ In 1867, after Governor William Gilpin had acquired a claim to the Sangre de Cristo grant, it was stated that its population was about 1,200, of whom 100 were Americans; the others were Mexicans.¹⁰

⁷ Whittaker, *Pathbreakers and Pioneers of the Pueblo Region*, 17-22, 84.

⁸ Hafen, "Status of the San Luis Valley, 1850-1861," in *The Colorado Magazine*, May, 1926, 49.

⁹ Hall, *op. cit.*, III, 329.

¹⁰ Blackmore, *Colorado: Its Resources, Parks, and Prospects*, etc., 215.

The first successful colony on the neighboring Martinez grant, west of the Rio Grande, was established in 1854. The promoter of this colony was José Maria Jaquez, who selected a site at Guadalupe, on the Conejos River, in August of that year. While final preparations were being made to move to the new location in the autumn of 1854, the colonists were joined by Major Lafayette Head of Servilleta.¹¹ Head was a Missourian who had gone to Santa Fé in 1846 as a private under the command of Colonel Sterling Price. At the expiration of his term of service he decided to remain in New Mexico, where, as merchant and colonizer, he rose to a position of influence among his Mexican friends as is shown by his subsequent elections to the legislatures of New Mexico and Colorado. In spite of troubles with the Indians, the Conejos colonists retained their lands; the population of Conejos County in 1868 was estimated at 2,000, mostly Mexicans.¹² Apart from an occasional Indian scare, it was a quiet life that the Mexicans lived in the San Luis Valley. Their principal industry was grazing, and for their flocks and herds there was an abundance of land and grass and water. In agriculture they followed the crude methods used by their fathers for generations before them. They were scarcely touched by the rushing currents of life in the outside world.

One of the best known of the Mexican land grants was the Maxwell grant, which was made to Guadalupe Miranda and Carlos Beaubien in 1841. In their petition to Governor Armijo of New Mexico they expressed a desire to improve a tract of unoccupied land by growing sugar beets on it, establishing manufactories of cotton and wool, and by raising stock of every description.¹³ Their grant was on the eastern side of the Taos and Sangre de Cristo ranges, between the Cimmaron on the south and Fishers Peak on the north. According to Kit Carson, a settlement was made on this grant as early as 1844,¹⁴ but it and other early set-

¹¹ Meliton Velasquez, in *Alamosa Journal*, October 22, 1925.

¹² Blackmore, *op. cit.*, 60.

¹³ *House Reports*, 36 Cong., 1 Sess., No. 321, 245-246 (Serial 1068); on this point I have been helped by a paper on the Maxwell Land Grant prepared by one of my former students, Miss Bess Mc Kennan of Trinidad.

¹⁴ *House Reports*, 35 Cong., 1 Sess., No. 457, 254 (Serial 967).

tlements in this region were south of the present state of Colorado. This vast estate finally passed into the hands of Lucien B. Maxwell, Beaubien's son-in-law. To the north of the Maxwell land grant, along the valleys of the Purgatory, Huerfano and Apishapa rivers, lay the Las Animas land grant of more than 4,000,000 acres made in 1844 to Ceran St. Vrain and Cornelio Vigil. Little had been done to develop this grant before the coming of the goldseekers, although in 1847 John Hatcher, a Virginian in the employ of St. Vrain and Vigil, had made a settlement on the Purgatory east of the site of Trinidad. He was, unfortunately, soon driven away by the Indians.

These Mexican land grants have a two-fold significance in the settlement of Colorado. In the first place, they led to the establishment of several Mexican colonies in the southern part of the state and thus started a stream of Spanish influence that still makes itself felt, adding to the richness and picturesqueness of life in Colorado. In the second place, they tended to hinder the settlement of the southern part of the state by Anglo-Americans because of the many disputes about land titles in this region of vast and indefinite land grants.¹⁵

From this state of comparative quiet and solitude Colorado was quickly transformed into a scene of restless activity when the goldseekers began to scurry like ants about their giant hills. Discoveries of gold near the mouth of Cherry Creek in the summer of 1858 were probably responsible for the selection of that spot as the place of abode for those who chose to spend the ensuing winter in the Pikes Peak country. These pioneers, mainly men from the Middle Western and Southern states, were accustomed to local self-government and to speculation in town lots. Although the discoveries of gold made thus far did not warrant their optimism, they laid out towns and selected delegates to represent them at Washington and in the Kansas Legislature.¹⁶ The first of the town companies was organized in September, 1858, by members of the Lawrence party. Their town of Montana City was located on the east

¹⁵ *Denver Daily Tribune*, July 14, 1871.

¹⁶ Hollister, *The Mines of Colorado*, 18.

bank of the South Platte about 4½ miles south of the State Capitol. Some of the men who had helped found Montana City believed that the land east of the mouth of Cherry Creek was a better location for a town, and there, on September 24, St. Charles City was laid out. In October, Auraria was started on the west side of Cherry Creek, and in November the site of St. Charles was "jumped" by members of the Lecompton-Leavenworth party who founded Denver City. By the spring of 1859 Montana City was abandoned, leaving Auraria and Denver on opposite banks of Cherry Creek to contend for supremacy in the region.¹⁷

The men who laid out Denver and the rival town of Auraria were wiser than they knew. Their towns, united into one municipality by act of the Legislature of Jefferson Territory in April, 1860, have grown into the metropolis of the Rocky Mountains, while scores of other towns with prospects apparently just as good have died or lagged far behind. And who could tell where Fate had decreed that a great city would be built? The pioneers, for example, who started Red Rock or Boulder in the winter of 1858-1859 had apparently as much reason as their fellows in Auraria-Denver to expect that their town would outstrip all its rivals. Another party of goldseekers, disappointed at the reports received from the Cherry Creek towns, spent the winter of 1858 at the mouth of Fountain Creek, and thus Fountain City was born, only to die shortly when Pueblo was started nearby.¹⁸

If gold had not been found in paying quantities all these towns might have died "a-borning." Fortunately for them George Jackson and John Gregory made their famous discoveries of gold early in 1859. The immediate future of Colorado was assured. Denver, located at a convenient terminus of the overland route from the East, and near the entrance to Clear Creek Cañon, became the most important plains city of the territory. In spite of attempts to build roads to Central City, Boulder was less fortunate,

¹⁷ There is an excellent and full account of the establishment of the various town companies in Smiley, *Semi-Centennial History of the State of Colorado*, I, Chap. XI.

¹⁸ Whittaker, *op. cit.*, 41-42.

although discoveries at Gold Hill and elsewhere gave it a mining hinterland of sufficient importance to keep it alive. At Fountain City or Pueblo there settled down some sagacious men who saw that farming and trading were likely to be fully as profitable as mining.

Mining, of course, was the chief interest. Rumors and exaggerated reports of the discoveries were carried to the East and resulted in a rush to Colorado in which more than 50,000 "Fifty-niners" took part. To the Clear Creek camps the newcomers turned as naturally as does the needle to the pole. By the end of May, 1859, there were 300 men at work in the Jackson Diggings, and there the Town of Idaho Springs grew up. About thirteen miles farther up the south fork of Clear Creek the foundations of Georgetown were laid. More important were the Gregory Diggings, where developed Black Hawk, Nevada and Mountain City—a camp which was soon absorbed by Central City. According to Hollister:

By the 1st of June, Gregory Gulch, from North Clear Creek to the confluence of Eureka, Nevada and Spring Gulches, was crowded with canvas tents, log shanties, and bough houses, as thick as they could stand, and there was a great deal more room then than now. . . . It was estimated that there were five thousand people in the gulch.¹⁹

Overcrowding in the Clear Creek camps and the restlessness of the miners caused hundreds of them to scour the hills in the summer of 1859 in the hope that they might match the discoveries of Jackson and Gregory. Encouraging reports from South Park resulted in a stampede from the Gregory Diggings. New camps sprang up almost overnight at Fairplay, Montgomery, Jefferson City, Mosquito and Tarryall. About the same time new towns were being established at the edge of the mountains. Golden, long a rival of Denver, was started by men interested in commerce as well as mining. Arapahoe City, situated between Golden and Denver, was not long a serious contender for first place among the "cities" of this region. Cañon City and Colorado City also date from the year 1859.

A memorial sent to the President and Congress from the newly organized Territory of Jefferson in January,

¹⁹ Hollister, *op. cit.*, 75-76.

1860, listed the principal towns in the mining country and gave the estimated population of each. It said:

The population of Denver is about 1,100; of Auraria, 1,000; Golden city 900; Arrappahoe 400; Colorado 300, and Mountain city 800; while in the other portions of the Territory there is population enough to swell the sum to about 8,000; nearly all of which are male adults, so that were the usual number or proportion of females and children added, the total population would be about 40,000.²⁰

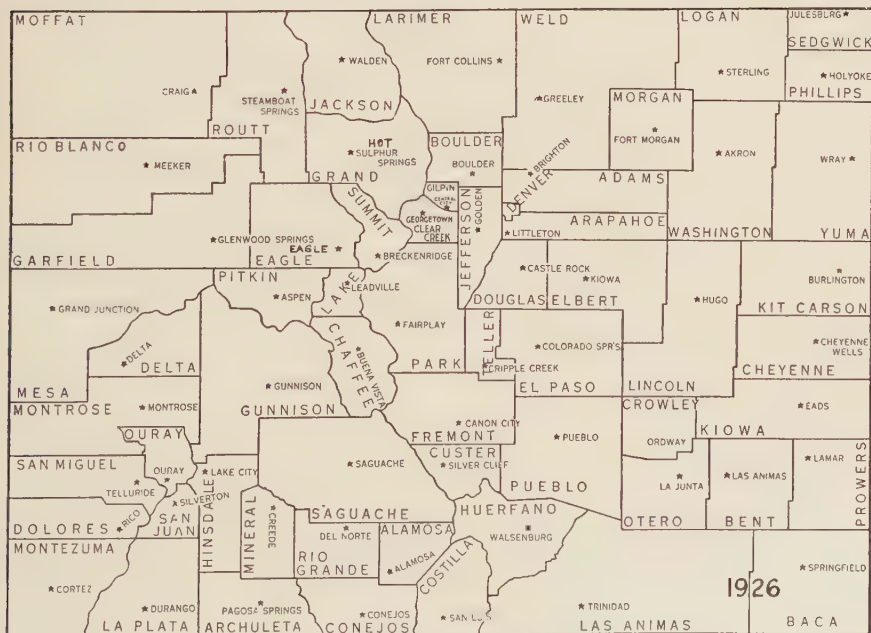
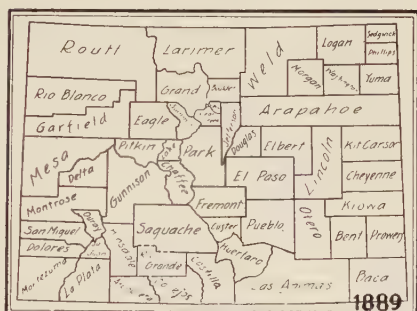
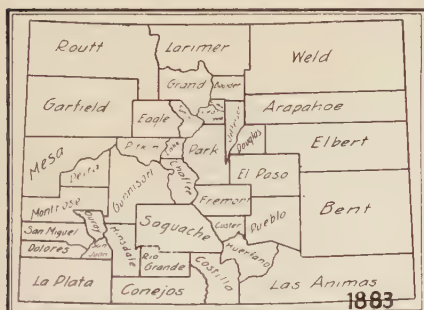
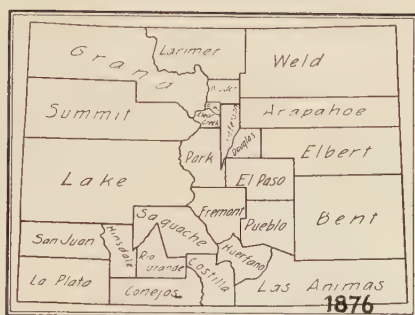
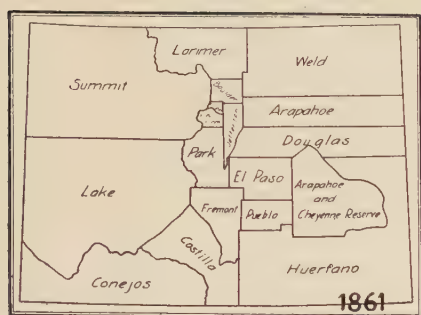
More of the "Fifty-niners" had gone back to the States than had stayed in Colorado. Of the thousands who had joined in the rush to the Pikes Peak country, the majority were disappointed or disgusted with what they found. The result was a stampede back to the Missouri River, a stampede in which, according to Smiley, at least 40,000 men took part. The trails followed by these "Gobacks"

were littered with wreckage almost as greatly as if a routed army had used the roads in headlong flight from the enemy. Broken-down wagons were left where they stood, and the waysides were strewn for hundreds of miles with other belongings which had been cast off—rough merchandise, camp equipment, mining tools, and all sorts of the odds and ends of their outfits, which had been thought not worth carrying back. Yet the cost of this discarded property had amounted to many thousands of dollars. No small number of the stampedeers had invested their entire financial resources in preparing for the abandoned venture, and practically were penniless when they arrived at the river.²¹

In spite of the bad name Colorado was given by these disappointed men, there were plenty more who were willing to try their fortunes in the following year. For about two months in the late spring and early summer of 1860 it was estimated that the arrivals from the East numbered about 5,000 a week. In the early spring of this year Breckenridge was founded on the west side of the Continental Divide; in the summer Buckskin Joe and Hamilton City, in South Park, attracted attention. The principal new mining camp opened up in this season was Oro City, in California Gulch, near the site of Leadville. A pioneer, in writing of his experiences in 1860, said:

²⁰ *House Mis. Doc.*, 36 Cong., 1 Sess., No. 10.

²¹ Smiley, *op. cit.*, I, 246.



SETTLEMENT OF COLORADO AS REFLECTED IN THE CREATION
OF NEW COUNTIES

California Gulch, at the time of our visit was the liveliest camp in the mountains. It was claimed that there were five thousand people there. Mining and prospecting was going on along the gulch for two or three miles. A large number of men were employed, and time to quit work at night was heralded by the cry of "Oh, Jo!" Starting at the lower end of the gulch, this was repeated all the way along. How it originated, I have forgotten, but all seemed to join in it, and the effect was somewhat weird and peculiar.²²

Of the thousands of goldseekers, comparatively few had any thought of permanent settlement. As one of them expressed it later:

It was thought that the country was not adapted to the pursuits of agriculture. Irrigation was little understood. No one believed that raising crops by that method could ever compete with the cheap products of the Western states . . .

Little was known of the country and the climate. Many different stories were told, but the impression prevailed that the winters were long and severe; that snow fell to great depths, especially in the mountains, and during the long winter all mining operations must be suspended . . . The great majority indulged the hope that, by enduring the hardships and deprivations incident to a miner's life in a new country for a limited period, they would acquire a fortune, or at least a competency, then return to family and friends in "God's country", as they termed their homes in the states, and enjoy the fruits of their labor . . .²³

According to the Census of 1860, Colorado had a population of 34,277. For obvious reasons this census taken in a region of frontier mining camps was inaccurate and incomplete. There were, however, enough people in the territory to warrant the establishment by Congress of a territorial government. The Legislature which met in 1861 divided the territory into seventeen counties. On the east was a row of large plains counties, four of which—Weld, Arapahoe, Douglas and Huerfano—stretched from the foothills to the Nebraska-Kansas line. The other two in this tier of counties—El Paso and Pueblo—stopped at the Arapahoe and Cheyenne reserve in the east central part of the territory. The whole of the western slope was divided into

²² Irving W. Stanton, "Early Days in Colorado," in *The Trail*, II, 8.

²³ *Ibid.*, 6.

three counties—Summit in the north, Lake in the middle, and Conejos in the south. In between the eastern and western tiers of counties were eight smaller counties named, from north to south, Larimer, Boulder, Gilpin, Clear Creek, Jefferson, Park, Fremont and Costilla.²⁴ All of the counties in the central group, except Costilla, which was inhabited principally by Mexicans, had been erected mainly to care for the needs of the people in the towns of the foothills and mountains. The three western counties were practically uninhabited by white men at this time.

By 1861 the mining excitement had largely subsided. Partly because of the outbreak of the Civil war, partly because mining in Colorado had ceased to be especially profitable, partly because new discoveries had been made in other parts of the West, the population of Colorado began to decrease. Indian depredations on the Great Plains during and immediately following the Civil war added to the uncertainties of life. Under such circumstances it is not surprising that the territorial census of 1866 revealed a total population of less than 28,000. It was a period of trial and discouragement for those who had pinned their faith to Colorado.

By the end of the '60s there were signs of recovery. The mining industry was being put on a more substantial basis; it had been learned by experience that there were wonderful agricultural possibilities in Colorado; Indian wars were practically at an end so far as the eastern half of the territory was concerned; the transcontinental railroad had become a reality. The completion of the Union Pacific in 1869 was followed quickly by the building of two railroads into Colorado. The Denver Pacific was completed from Cheyenne to Denver in June, 1870; the Kansas Pacific reached Denver a few weeks later.

Both the Denver Pacific and the Kansas Pacific were land grant railroads. They were anxious to sell their land to get money and to create a constituency along their tracks. In order to sell land an extensive advertising campaign was carried on, largely through a subsidiary organization

²⁴ Paxson, "The County Boundaries of Colorado," in *University of Colorado Studies*, III, 199.

known as the National Land Company. Before it could expect to sell much land to prospective farmers it was necessary to rid their minds of the notion of a "Great American Desert" along the eastern base of the Rockies, and to point out the advantages of engaging in agriculture in the semi-arid regions of the West. The idea of a desert, based in part on the writings of Pike and Long, and popularized by repetition in school books and on maps, was still widely held as late as the close of the Civil war. General John Pope, who was in command of the Department of Missouri, which included Colorado, wrote in one of his reports in 1867 that there was a belt of land never less than 500 miles wide stretching from Canada to Mexico along the base of the mountains which was "beyond the reach of agriculture, and must always remain a great uninhabited desert." "This region was," he said "utterly unproductive and uninhabitable by civilized man."²⁵

To refute such opinions the National Land Company, through its advertising medium named the *Star of Empire*, the promoters of various agricultural colonies and towns, and the Colorado newspapers, called attention to the prodigious crops that had already been grown in the territory. The following extract from a pamphlet issued by the Chicago-Colorado Colony in July, 1871, is typical of this sort of advertising:

Ninety-seven bushels of wheat have been raised on one acre of land on the South Platte. Oats have reached the same number of bushels to the acre; and Governor McCook is our authority for the statement that 250 bushels of onions have been raised on *half* an acre. These, of course, are exceptional cases and the result of high cultivation; but the average of crops may thus be stated: Wheat, 30 bushels; oats, 55; corn, 30; potatoes, 250; onions, 300; beans, 30; Ruta Baga turnips, 30 tons; beets, 30 tons. These figures may be relied upon as being, if anything, *below* the average . . .

A few words in relation to beets. The growth of sugar beets here is simply enormous. The soil seems peculiarly adapted to their cultivation, and hundreds of acres could be profitably grown if some far-seeing and enterprising capitalist would but invest a few spare thousands of dollars in the erection of a beet sugar mill . . .

²⁵ *House Ex. Doc.*, 39 Cong., 1 Sess., No. 76, 2.

At the Denver Fair turnips were on exhibition, and curiosity impelled us to measure the largest; it was forty-two inches in circumference. Cabbages weighing fifty pounds were too common for especial mention; and we could easily credit the story of the prudent house-keeper, who sent her child to market for the smallest head he could find, and he came home bending under the weight of a fourteen-pounder, having searched vainly for one of less weight.²⁶

Likewise, the advantages of irrigation were stressed by those who wanted to sell land in Colorado. To irrigate land, it was claimed, cost no more than to break and drain land in an Eastern state. A drought had no terrors for the farmer who relied on irrigation, while the silt carried down by the water and deposited on the soil acted as a fertilizer. Another inducement held out to the prospective farmer in Colorado was the steady market in the mining camps for what was raised. On account of the distance from the East and the existence of a region in Western Kansas and Nebraska and Eastern Colorado which, because of lack of water for irrigation, would remain barren, the farmers living on the irrigable lands near the base of the mountains would have little competition in the sale of their produce in the mining towns.

The time was ripe for a new advance of the agricultural frontier. In both North and South the Civil war was followed by a period of adjustment such as usually results in the shifting of peoples. Prices of farm products were still high, thus giving an added stimulus to the normal desire of the landless man to take advantage of the Government's new homestead policy. Colorado, a land associated with romance and gold, stood ready to welcome the newcomers. It was under these circumstances that the farmers' frontier jumped from Central Kansas and Eastern Nebraska to the irrigable lands along the eastern base of the Rockies.

In this early migration of farmers to Colorado the distinctive phase was the establishment of colonies. Although examples of community migration to the West had not been lacking on earlier frontiers, and, indeed, had been the usual

²⁶ Willard and Goodykoontz, *Experiments in Colorado Colonization, 1869-1872* (University of Colorado Historical Collections, III), 149-150.

method of settlement in New England in the colonial period, the family had been the normal social unit on the frontier throughout the nineteenth century. The average pioneer was too individualistic to bind himself to any closely organized group except temporarily. In the settlement of Colorado and in parts of Kansas and Nebraska, however, several interesting experiments were made about this time in the establishment of coöperative or semi-coöperative colonies. The fact that the Mormons had been successful in establishing their communities in a similar region through coöperative effort may have suggested the desirability of employing this method in Colorado. At any rate, one of the principal reasons given for joining a colony was the necessity for community action in the construction of irrigation systems. Other advantages, such as cheaper rates on railroads, social life with better schools and churches, and the possibility of creating a homogeneous community, were pointed out by the advocates of colonization.

The first of the agricultural colonies to settle in Colorado was the German Colonization Company, which was organized in Chicago in the summer of 1869 by Carl Wulsten. His purpose was "a desire to ameliorate the physical condition of the poorer class of Germans, who were condemned by a cruel fate to work in the greasy, ill-ventilated and nerve-destroying factories of the great city of Chicago."²⁷ Wulsten's plan was that the members of the company should work together for five years to establish the colony. The fund of capital created by the membership fees was to be used to defray the cost of transporting the members from Chicago to the site chosen in the Wet Mountain Valley, south of Cañon City, to erect colony buildings, and to purchase seed, stock and agricultural implements. In a memorial to Congress²⁸ in 1869 Wulsten made the estimate that it would cost \$690 to transport a family of four from Chicago to the Far West, to buy the necessary live stock, tools and seed for farming, and to

²⁷ Carl Wulsten, "El Mojada, or the Wet Mountain Valley," in Binckley & Hartwell, *Southern Colorado*, 107.

²⁸ "Petition of the German Colonization Company of Colfax, Fremont Co., Col.," in *Sen. Mis. Doc.*, 41 Cong., 2 Sess., No. 22.

maintain the family until the first crop could be harvested. As he pointed out, many poor people did not have so large a sum of money and thus could not take advantage of the homestead law without going into debt. Through the economies of coöperation Wulsten proposed to finance such a move on a much smaller amount of money per person. As citizens the members of the company were each entitled to take up a quarter section under the homestead law. But in order that they might settle in a compact group, Wulsten petitioned the Government for a grant of 40,000 acres of land on condition that it be divided *pro rata* among the members. His proposal, in brief, was that the homestead law be amended so as to apply to societies or corporations as well as to individuals. In this petition the proposed colony town in the Wet Mountain Valley was named Colfax in honor of Schuyler Colfax, who was then Vice President of the United States. Although the grant was not made, about 250 colonists left Chicago in February, 1870. They were well supplied with stock, domestic utensils and farming implements.²⁹

In spite of the fact that Colorado was anxious to receive desirable immigrants, the arrival of the Germans in Southern Colorado was the occasion for a controversy in which the editor of the Pueblo *Chieftain* and Wulsten were the principals. Wulsten had asked the War Department for an escort of soldiers and aid in transporting the colonists from the end of the Kansas Pacific at Fort Wallace to their destination in the Wet Mountain Valley. The War Department furnished ambulances in which to haul the colonists and allowed them the use of Government tents. Edward McCook, governor of Colorado Territory, sent some arms and ammunition and issued commissions in the territorial militia to the officers of a military company organized among the German colonists. The *Chieftain* ridiculed the Germans for their timidity and denounced the Government for its favoritism. But let the *Chieftain* speak for itself:

Now, it will be borne in mind that the old citizens of Colorado; we who have lived here for ten or twelve years;

²⁹ *Chicago Tribune*, February 9, 1870.



UPPER, LOVELAND; MIDDLE, FORT COLLINS;
LOWER, STERLING

before the days of railroads; when the population was sparse, and surrounded by hostile Indians, . . . found it extremely difficult to prevail upon the authorities to furnish arms for the protection of our homes, much less furnishing us military escorts and ambulances in making our journeys and settlements . . . But now, when a party of emigrants propose to ride across the plains, into the settlements of the Territory, and travel thence to their destination through a thickly settled country, over a road filled with freight teams, and a daily line of coaches running over it, past two military posts, . . . a man goes to Washington and proposes to come out here and make a settlement, and call it after the name of the Vice-President of the United States, he is rewarded with immediate smiles, the ear of the Government is bent listening, and the great Secretary of War is made to come down, and he forthwith sends orders to military posts all along the line to furnish escorts of troops, arms and rations, to cover the march of these Teutons along through the peaceful cornfields of Pueblo and Fremont counties . . .³⁰

Inasmuch as the *Chieftain* was Democratic in politics, the Republican papers in the territory interpreted its hostility to the Germans as an expression of narrow partisanship. They accused it of trying to hinder the colonization of the territory simply because it feared that the Germans, who boasted loudly their Republicanism, would add materially to the number of Republican votes cast in Southern Colorado.

The attempt of the Germans to establish a coöperative colony in the Wet Mountain Valley was a failure. Their leader was hot-headed, arbitrary and impractical. The colonists lacked experience as farmers and could hardly have expected that their first attempt to raise a crop at an elevation over 8,000 feet would have been successful. With dissension in the ranks, and failure staring them in the face, the colony began to break up in the autumn of 1870. Some of the colonists went to Cañon City, others to Pueblo or Denver. Those who stayed in the valley abandoned their coöperative experiment, made an informal division of the property of the company, took up Government land and became prosperous farmers. Some of them and their descendants may still be found in the Wet Mountain Valley.

³⁰ *Colorado Chieftain*, February 24, 1870.

Several years after the colony had broken up Wulsten wrote concerning the experiment: "Collectively a failure, it has individually become a distinct success, for every family which entered El Mojada is today in perfectly independent circumstances."³¹

The most famous of all the Colorado colonies, and the one after which at least two others were patterned, was the Union Colony at Greeley. Nathan Meeker, agricultural editor of the *New York Tribune*, after a visit to Colorado in the autumn of 1869, issued through the *Tribune* a call for a meeting of all persons interested in the organization of a colony. In this call Meeker emphasized those features of community life usually associated with the New England town. He said:

My own plan would be to make the settlement almost wholly in a village, and to divide the land into lots of 10 acres, and to divide these into 8 lots for building purposes, and then to apportion to each family from 40 to 80, even 160 acres, adjoining the village . . .

Some of the advantages of settling in a village will be: easy access to schools and to public places, meetings, lectures and the like, and society can be had at once. In planting, in fruit-growing, and in improving homes generally, the skill and experience of a few will be common to all, and much greater progress can be made than where each lives isolated . . .³²

Horace Greeley, editor of the *Tribune*, was noted for his interest in humanitarian schemes and naturally gave his support to the project; the colony town, when established in the spring of 1870, was appropriately given his name. In April, 1870, there were on the colony roll the names of 432 members who had paid the membership and initiation fee of \$155; they came mainly from New England and the north central states. In October, 1870, it was estimated that there were eight hundred colonists in Greeley.

Although conditions were unusually favorable for the establishment of the Union Colony, there was a period of confusion and doubt at the beginning. Not all of the colonists were satisfied. Several years later one of the original

³¹ Binckley & Hartwell, *op. cit.*, 107.

³² Willard, *The Union Colony at Greeley, Colorado*, 1-2.

settlers wrote as follows concerning the misgivings of the Greeley pioneers:

Doubts chased each other through our minds as the fleet antelope chased its fellow across the broad prairies. Fears came with the morning sunbeams, and were not dispelled when the shadows of the night fell down upon us . . .

Can the reader imagine the situation? The chosen ground was unbroken for miles, and the winds of unnumbered centuries had blown off the light soil, leaving a coat of gravel over the surface not covered by grass, or cactus. This grass was short and brown, and presented to the eye no evidence of its nutritive qualities, while the cactus did not then wear the variegated blossoms that make it attractive to the eye, while its prickley armor in no way commended it to the touch.

There were days when from fifty to one hundred persons arrived, hardly any bringing with them provisions, tents, blankets, or any of the necessities of life. They could barely protect themselves from the cold winds, or still colder night air. No canals had been dug, no water was running, and in all the town there was but one well.

Those were dark days for colonization in Colorado. Some there were who seemed to forget that it was the work of the colony to create a city, who expected to see one already built, with houses and stores, mills and factories, schools and churches—in fact all the adjuncts of a settled civilization. Disappointments set their teeth on edge, and kindled bitter feelings of animosity in their hearts. Tongues wagged, not wisely or well. Men had come to colonize, but not waiting to investigate, to examine the location, to test the capabilities of the soil, they remained to curse only so long as the next train east delayed its going.³³

In spite of such discouragements, the Union Colony was a success from the outset. It was a semi-coöperative undertaking: the colony secured the land, laid out the town, divided the farm and town lots among the members, and constructed the necessary irrigating ditches. The management of the colony was efficient; a good location had been selected; the colonists were people of high moral principles. From the beginning Greeley was a temperance town; the Greeleyites often attributed their success to their adherence to this principle, and probably thanked God that their town was not as Evans.

Evans was not a temperance town. It had been laid

³³ Pabor, *Colorado as an Agricultural State*, 32-33.

out in the autumn of 1869 by men connected with the Denver Pacific Railway Company. For a few months it enjoyed a typical western boom and was, during the winter of 1869, the southern terminus of the railroad. After the road was completed to Denver in June of the following year, the fortunes of Evans declined rapidly. Even so it might ultimately have satisfied the expectations of its founders and become the chief town between Cheyenne and Denver, had not the stronger town of Greeley been established only four miles away. The decline of Evans was retarded, however, by its selection in the spring of 1871 as the site of the St. Louis-Western Colony. This colony had been formed at Ayres Point, Illinois, in the autumn of 1870 by a group of Covenantors under the leadership of their pastor, the Reverend Andrew C. Todd.³⁴ The plan of the colony was essentially the same as that of the Union Colony, but it was less successful. The two colonies were started only four miles apart at almost the same time under conditions that appeared to be practically identical. To some observers the only important difference was that the one forbade and the other permitted the sale of intoxicating liquors. Although not inclined to minimize the importance of temperance principles, David Boyd, the historian of the Union Colony, attributed the greater success of the people of Greeley primarily to the superiority of their lands and to the fact that the men who undertook farming around Evans "were singularly deficient in wideawakeness, push, energy, courage, ability to meet new emergencies, fertility of invention".³⁵ In June, 1871, the population of Evans was reported at five or six hundred. Although Evans was the seat of government for Weld County until 1877, except for a short time in 1874-1875, it was never able to compete on even terms with its more vigorous neighbor in business, population, or enterprise.

Longmont was founded by the Chicago-Colorado Colony, which was organized in Chicago in November, 1870, largely under the auspices of the National Land Company. The

³⁴ Willard, "Evans and the Saint Louis Western Colony," in *The Trail*, XI, 5-11.

³⁵ Boyd, *History of Greeley and the Union Colony of Colorado*, 181.

colonists came mainly from the middle-western and north-central states. A good site was chosen in the northeastern corner of Boulder County, and by July, 1871, there were several hundred inhabitants in the new colony town of Longmont. The rapidity with which the frontier was transformed into a region of thriving towns under the colony plan of settlement is strikingly shown by the following list of branches of business in operation in Longmont three months after the town was started:

A bank, three dry goods stores, three hardware stores, one furniture store, three groceries, two general stores, three agricultural implements and wagon depots, one lumber yard, three blacksmith shops, two shoemakers, one photograph artist, one drug store, two hotels, butcher, barber, lawyer, surveyor, four physicians, three insurance agents, bakery and confectionery, milliner, dressmaker and fancy dry goods, cigar and tobacco store, livery stable, and three contracting carpenters.³⁶

The colony idea having met with popular favor, promoters and speculators took over the name but discarded such features of a real colony as did not suit their purposes. A significant project was the so-called Southwestern Colony which was promoted by Davis S. Green, of Memphis, Tennessee. It was started in 1871 and was primarily a scheme by which lots in Green City, located on the Platte about thirty miles below Greeley, might be sold. Membership in the colony was obtained by the purchase of one or more lots in the "colony town". Green and his associates sold lots freely, especially in the southern and border states. Some of the purchasers came to Green City to settle in good faith; others bought lots in order to profit by the promised increase in land values. A town was started but inefficient management, difficulty in getting water on the land, and delay in building a railroad from Denver to Julesburg, helped bring about its early death. Not a trace of Green City remains at the present time.³⁷

Town development companies were active in this period and, when honestly managed, served a useful function in the development of the territory. Some of the towns launched

³⁶ Taken from a pamphlet issued by the Chicago-Colorado Colony in June, 1871, reprinted in Willard and Goodykoontz, *op. cit.*, 147.

³⁷ Willard and Goodykoontz, *op. cit.*, xxxv.

in this fashion, such as Platteville, Monument, and New Memphis, never amounted to much. Others, notably Fort Collins, Colorado Springs, and South Pueblo, were more successful. Although called the Fort Collins Agricultural Colony, it was really a town development company that was responsible for the establishment of a town in 1872 on the former site of a government post on the Cache la Poudre River.³⁸ The most prominent of the town development companies of this period was the so-called Fountain Colony which was responsible for the establishment of Colorado Springs. This "colony" was closely associated with the Denver and Rio Grande Railway Company which, not having received a grant of land such as the federal government gave to the Union Pacific and to the Central Pacific, was built by private capital. The men who invested money in the Denver and Rio Grande were allowed also to hold shares in affiliated land companies. Part of the return on the investment was to come from the sale of lots in new towns to be laid out and "boomed" along the line of the railroad. In carrying out this policy towns already in existence were sometimes ignored or slighted in order to build up new towns in which the company was interested. It was in accordance with this policy that Colorado Springs was laid out although there was an older town, Colorado City, in the vicinity. Another of the town development companies affiliated with the Denver and Rio Grande Railroad was the Central Colorado Improvement Association which was responsible for the establishment of South Pueblo in 1872.³⁹

In the summer of 1871 a Denver newspaper estimated that in the preceding twelve months Colorado Territory had received fully five thousand new inhabitants as a result of colonization, and that twice as many more had come in the ordinary manner.⁴⁰ Many of the latter settlers doubtless had had their attention called to Colorado by the extensive advertising it had received from the various development and colony companies.

At the same time that the colonies were being established

³⁸ *Weekly Rocky Mountain News*, August 6, 1871; May 27, 1874.

³⁹ *Weekly Rocky Mountain News*, February 18, 1874.

⁴⁰ *Denver Daily Tribune*, August 8, 1871.



SOUTHERN COLORADO CITIES

Upper, Durango; Middle, Alamosa; Lower, Trinidad

there was a revival of interest in mining as a result of discoveries made in 1870 in the San Juan Mountains. In the spring of 1871 there was a rush to that remote corner of the territory. The fact that this region was closed to whites by a treaty made with the Ute Indians in 1868 made no difference to the eager miners. In response to protests from the Indians, troops were sent in 1872 to drive out the trespassers. As usual such an attempt to protect the natives met with indifferent success. In 1873 the Brunot treaty was negotiated with the Utes by which they surrendered their claim to about three million acres of mineral land in the San Juan country. Silverton, Ouray, and Lake City are three of the towns that grew out of this mining boom. Telluride and Rico date from 1878; Durango was founded in 1880. Not all of the pioneers in the San Juan country were miners. Some there were who saw the need for an agricultural community in the vicinity of the mines, and who located ranches in the Animas Valley. According to Hall, within thirty days after the signing of the Brunot treaty every available acre of land in this valley had been staked off in ranch claims.⁴¹ Until the railroad reached this country in the early 'eighties, it was difficult of access. The main route followed was through Pueblo and the San Luis Valley.

As stated above, Mexican communities in the San Luis Valley antedated the coming of the Anglo-American miners and settlers. New towns now grew up in this valley to meet the need for outfitting points and way stations on the road to the San Juan mines. Del Norte, established in 1872, served also as a wintering place for the miners of the Summit district. The Americans realized the agricultural possibilities of the valley and began to experiment in farming and stock-raising. Towns and ranches in the San Luis Valley and mines in the San Juan Mountains brought in the railroad. In keeping with its policy of building branch lines into the mountains, the Denver and Rio Grande Railway Company laid a track across La Veta pass and down into the San Luis Valley in 1877-1878. The coming of the railroad, of course, stimulated settlement in the valley. At

⁴¹ Hall, *op. cit.*, IV, 169.

once the town of Alamosa was started. More farmers came in; among them a group of Mormons who established a community at Manassa. In the 'eighties Monte Vista was founded.

At the same time that the San Juan mines were attracting attention, the Wet Mountain Valley on the eastern side of the Sangre de Cristo range was enjoying a mining boom. Although gold and silver had been discovered in this region in 1870, the richness of the mines was not appreciated until 1873. In that year the town of Rosita was laid out. To the person who suggested this euphonious name for a mining camp instead of such commonplace appellations as Mountain City or Central City, or such undignified names as Tincup or Mosquito, we should be duly grateful. By 1874 the new town had a population of over one thousand.

The climax of mining excitement, however, came in 1877 when Leadville burst upon the world as a star of first magnitude. During the early period of gold excitement in Colorado, California Gulch had been a scene of considerable activity. But by 1863 California Gulch and Oro City had ceased to be important. Mining in this region continued on a small scale until about 1877 when it was discovered that the hills around California Gulch were full of carbonate of lead carrying silver. The "Camp of the Carbonates" which grew up here was named Leadville. Its population grew by leaps and bounds. In the census of 1880 Leadville appears as the second largest city in the state, having a population of nearly fifteen thousand. One of the men who was there at the time of greatest excitement wrote a few years later, with pardonable exaggeration:

The place was so crowded you could scarcely wedge your way through. There was any number of reckless people here: so many lounging around doing nothing; just living on excitement. Concert saloons, etc., were thronged at night; men would sleep on chairs and be glad of one; four-fifths of the habitations were made of rough boards or tents.⁴²

As a result of the fabulous discoveries at Leadville, there was a renewal of interest in mining. Wherever the

⁴² Boettcher, "The Flush Times of Colorado," in Bancroft MS., University of California (copy in University of Colorado Historical Collections).

ores found bore any resemblance to the Leadville product there was great excitement. The discovery of such ores in the Wet Mountain Valley in 1878 led to a new rush to the vicinity of the Rosita mines, and the establishment of Silver Cliff. It quickly grew into the third largest town in the state, having a population of over five thousand in 1880. Many other mining camps date from this period: Redcliff and Virginia City or Tincup were located in 1879; Aspen, one of the more important mining towns of the state, dates from 1880; Bonanza in the Kerber Creek district in Saguache County from the same year. To serve the needs of the new mining camps the Denver and Rio Grande Railroad completed its line to Leadville in 1880; among the towns that grew up along the line to the south of Leadville were Salida (1880) and Buena Vista (1879).

The decade of the seventies was one of active railroad construction in Colorado. Reference has already been made to the Denver Pacific, the Kansas Pacific and the Denver and Rio Grande companies. The Atchison, Topeka and Santa Fé entered eastern Colorado in 1873. Granada was for a time the western terminus of this line; La Junta was a lively "end-of-track" town for a few months in the winter of 1875. Las Animas, another important trading center in the Arkansas Valley had been founded in 1869 in the neighborhood of Fort Lyon. After the building of the Santa Fé Railroad to Pueblo, the postoffice at the little town of Rocky Ford was moved from the river to the railroad three miles distant, and there a new town bearing that name was laid out. About the same time the Colorado Central Railroad was extending its line north from Golden. After the completion of this road to Cheyenne in 1877, Loveland and Berthoud were started in the valleys of the Big Thompson and the Little Thompson.

Except for the initial gold rush, Colorado's period of most rapid growth was in the decade ending in 1880. In 1870 the territory had a population of 39,864; in 1880 the state, then four years old, had 194,327 inhabitants. All parts of the state had shared in the increase. Lake County, on account of the Leadville boom, had shown the greatest growth, its population having increased from 522 to 23,563 in this ten year period. Clear Creek, another mining

county, had grown from 1,596 to 7,823; Summit from 258 to 5,459. Of the plains counties, Arapahoe, which included Denver, had raised its population from 6,829 to 38,644. El Paso, with Colorado Springs as its chief town, had grown from 987 to 7,949; Boulder County, partly on the plains and partly in the mountains, was credited with 9,723 in 1880 as against 1,939 in 1870.

The formation of new counties by the subdivision of the larger units is another indication of the spread of settlement. In 1870 there were twenty-one counties in the territory. At that time Summit, Lake and Conejos, the three large counties on the Western Slope, remained practically as they had been drawn by the first territorial legislature in 1861. By 1870 Greenwood and Bent counties appeared on the map taking the place of the earlier Arapahoe and Cheyenne reserve in the east central part of the territory. By 1870 Costilla had been cut down to make Saguache, while Huerfano was greatly reduced in size as a result of the erection of Las Animas. The central mining counties remained in 1870 about as they had been drawn in 1861.

Between 1870 and 1880 ten new counties were created, revealing by a glance at the map the results of the new settlements made in the San Juan country, in the Wet Mountain Valley and around Leadville. In the central mining region Grand County had been made out of a part of Summit, while Lake had been greatly reduced in size by the establishment of Gunnison and Chaffee. The southern end of Frémont had been cut to make Custer County, thus accommodating the residents of the Wet Mountain Valley. In the southwest, Ouray, San Juan, La Plata, Hinsdale and Rio Grande, bore witness to the recent development of the San Juan country.⁴³ In the northwestern part of the state, Routt County appeared on the map for the first time in 1877. The eastern tier of counties, Weld, Arapahoe, Elbert, Bent and Las Animas remained unchanged. Although their inhabitants had increased greatly in number during this decade, there had been no great shifting of the centers of population. The eastern portions of these large plains

⁴³ Paxson, *op. cit.*, 202-207.

counties were still so sparsely settled as not to warrant their subdivision.

The revival of interest in mining, the coming of the railroads, the establishment of the agricultural colonies, and the great increase in the population of the territory justified the admission of Colorado into the Union as the Centennial State in 1876. In 1880 the future of Colorado was bright: the silver mines were pouring out their flood of precious metals; real estate values were rising; on the Eastern Slope farmers were cautiously feeling their way out into the semi-arid region that had for several years been dedicated to the cattle industry; on the Western Slope the pioneers were impatiently waiting for the opening of the old Ute Reserve.

As one of the results of the White River Ute massacre in 1879, in which Nathan Meeker, Indian agent, lost his life, the cry was raised "the Utes must go". By an agreement made in 1880 the Utes abandoned, save for a fifteen mile strip in the extreme southwestern corner of the state, the reservation secured to them by the treaties of 1868 and 1873. The new treaty cleared the way for the settlement of the valleys of the Gunnison, the Grand and the White rivers. Throughout the state there was rejoicing. The *Ouray Times* said:

Sunday morning the Utes bid adieu to their old hunting grounds and folded their tents, rounded up their dogs, sheep, goats, ponies and traps, and took up the line of march for their new reservation, followed by General McKenzie and his troops. This is an event that has been long and devoutly prayed for by our people. How joyful it sounds, and with what satisfaction one can say, "The Utes have gone". The great menace to the advancement and development of this grand southwestern country is no more. Eastern people can now come to this section in the most perfect security. Besides it throws open to the dominion of white men one of the most fertile and beautiful valleys in all Colorado; a valley that will be to those who are so fortunate as to become owners of its broad acres, a happy land of Canaan.⁴⁴

The agricultural frontier had reached the Ute Reserve at certain points several years before settlement in the

⁴⁴ *Denver Daily Times*, September 12, 1881; for this reference I am indebted to Miss Grace Burnham of Boulder.

reservation was legally permissible. As early as 1874 there was a settlement at Gunnison, a short distance east of the territory reserved for the Utes. The leader in the establishment of Gunnison was "Professor" Sylvester Richardson. As geologist with the Parsons expedition of 1873, he had become acquainted with the mineral and agricultural possibilities of the Gunnison country, and in 1874 had organized in Denver a stock company for the establishment of a town therein. About twenty-five cabins were built by the colonists in the first season. For several years Gunnison remained an unimportant, straggling frontier town. Then came the excitement at Leadville, and Gunnison shared in the boom because carbonates were found in the vicinity. History students at the Western State College have written regarding this period at Gunnison:

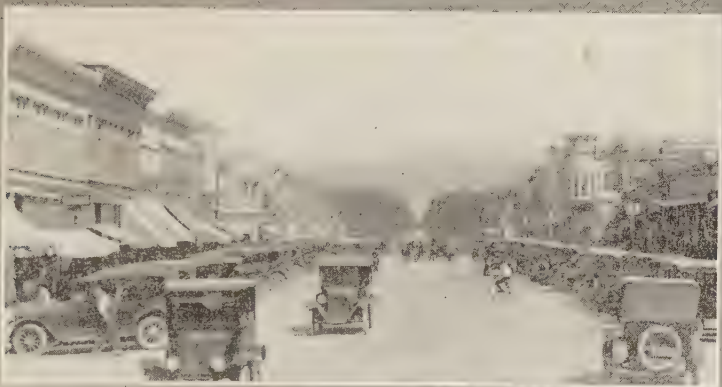
In the spring of 1879 the rush began. Prospecting was conducted on a tremendous scale. An entire new town organization was effected . . . Thousands came weekly. A correspondent writing to the Pueblo *Chieftain* from Parlin's ranch, on May 17, 1880, says that on the day previous he counted two hundred fifty teams bound for Gunnison, Ruby, Gothic. "One would think," he says, "that there must be an end to this procession, but the end is not yet, for far away on the Saguache road, there is a long line of white wagon covers."⁴⁵

The settlement of the Gunnison country made it certain that the whites would soon occupy the old Ute Reservation. Long before Congress acted to legalize settlement in the territory abandoned by the Indians, squatters had taken up the lands they desired. As early as January, 1882, Indian Commissioner Otto Mears said: "I doubt if there is a decent site for a ranch in either the Valleys of the Uncompahgre, Gunnison or Grand rivers that has not already been taken up."⁴⁶

Among the towns established in the former Ute Reserve in 1881 and 1882 were Montrose, Delta and Grand Junction. The valleys of the Uncompahgre, Gunnison and Grand rivers were quickly settled by farmers who soon discovered that certain parts of this country were by soil and climate peculiarly adapted to fruit growing. Here in sheltered

⁴⁵ *Historical Sketches of Early Gunnison*, 19.

⁴⁶ *Denver Daily Times*, January 7, 1882.



CITIES OF THE WESTERN SLOPE

1. Delta. 2. Montrose. 3. Grand Junction

valleys under lofty mesas fruit grows in profusion. The broad flat tops of the mesas are covered with snow until the middle of spring thus keeping the air cool in the valley below and preventing trees from coming into bloom until all danger of frost is past. If the mesas were higher or rough, the snow might remain all summer and possibly cause frosts.⁴⁷ The formation of the Grand Junction Fruit Growers Association in 1887 was an indication of the growing importance of this industry.

The growth of this part of Colorado, known locally as the Western Slope, in the decade ending in 1890 is shown clearly by the census reports and by the establishment of new counties. In 1880 Gunnison County reached from the Saguache mountains to the Utah line; it was approximately one hundred and forty miles long and eighty miles wide—as large, roughly speaking, as Connecticut and New Jersey combined. In 1880, thanks to the recent developments in and around the town of Gunnison, it had a population of about eight thousand. By 1890 Gunnison County had been cut to its present limits in order to make Pitkin, Mesa, Delta and Montrose counties. Gunnison County in 1890, partly because of its reduced size, partly because of the depression in the mining industry at that time, had a population of only 4,359. The counties that had been made out of Gunnison in this ten year period, however, had a population of nearly twenty thousand. In this same decade the large Summit County of 1880 was cut in size by the formation of Rio Blanco, Garfield and Eagle counties.⁴⁸ They and the neighboring county of Routt were still largely devoted to stock raising.

In the late 'eighties the outstanding development in the settlement of Colorado was the movement of farmers into the semi-arid, non-irrigable lands in the eastern part of the state. In the valley of the South Platte there were already settlements at Fort Morgan, Sterling and Julesburg. In the Arkansas Valley below Pueblo there were several agricultural towns. On the dry land between these two valleys

⁴⁷ Paul Richter, quoted by Benton Canon in booklet, "Personal Statement," Grand Junction, July 4, 1912.

⁴⁸ Paxson, *op. cit.*, 212.

there were a few small towns along the railroads, such as Cheyenne Wells (1869) and Kit Carson (1870). But hitherto much of the land in this region had been thought worthless except as a cattle range. But the day of the cattleman was passing; the day of the farmer or "nester" was coming. As the frontier was pushed farther and farther westward, and as good agricultural land became less plentiful, land-hungry farmers ventured out onto the less desirable lands of western Kansas and Nebraska. By 1886 the overflow from these states was making its influence felt in eastern Colorado. A few years of unusually heavy rainfall in this region seemed to prove the soundness of the theory widely held that as land was brought under cultivation, rainfall increased. For a year or two the movement of farmers into eastern Colorado attracted little attention in the state, except to call forth occasionally a prediction of failure and suffering from those familiar with the older methods of agriculture and unconvinced about the feasibility of "dry farming."⁴⁹ To the surprise of those who had predicted failure, the experiment apparently was successful. Late in 1887 a representative of the *Denver Republican* visited the "rain-belt," as this part of the country was called, and reported that the people were prosperous and that the country was rapidly filling up. He wrote:

The condition of the people in these new sections is gratifying in the extreme. They have raised sufficient to feed them through the winter and have some to sell. The corn and all else was grown upon the sod but with results that far exceeded the most sanguine anticipations of the veterans who have seen the development of Kansas and Nebraska. To these the "rain-belt" section of Colorado is now what those states were six years ago. These men form a large percentage of the new settlements, and their influence amongst the influx of population in Colorado from other States has the effect of calming the doubts of those less experienced in the development of the newer states. For the settlers who came in with but limited means, the first year has been a rugged one in some respects and fraught with privations usually necessarily experienced in any new farming community, but it was noted along the route traveled that

⁴⁹ *Denver Daily Times*, October 16, 1886.

none who came to stay have gone back through discouragement.

The entire country along the Burlington Railroad in Colorado east of Denver is pretty generally settled. The most of the residents having gone in during the past summer, their farms as yet have not assumed much beauty as regards outward appearances, nor has much been done toward building fences and pretentious structures; but the lands for from one to ten miles on each side of the road are dotted here and there with newly-erected cottages . . . Some are painted and lend thereby an appearance of thrift among the people, while others yet retain the original color of the lumber with which they are erected. The less costly "dug-out" is here and there a feature of the surrounding country.⁵⁰

The Lincoln (Nebraska) Land Company was active in the establishment of towns in northeastern Colorado at this time. Among the towns started in this period were Akron, Burlington, Eckley, Eads, Chivington, Springfield, Haxtun, Holyoke, Laird, Logan, Sheridan Lake, Otis and Wray. Towns already established, such as Julesburg and Sterling, shared in the apparent prosperity.

As late as 1885 the whole eastern plains region of Colorado was divided among five large counties, Weld, Arapahoe, Elbert, Bent and Las Animas. No changes had been made in the boundaries of these counties since 1874. In 1887, as a result of the new settlements in the northeastern corner of the state, the eastern half of Weld County was taken to make Logan and Washington counties. In 1889 Weld was further reduced in size by the formation of Morgan County, while Yuma was carved out of Washington, and Sedgwick and Phillips out of Logan. Out of Elbert and Bent were made in 1889 the additional counties of Kit Carson, Lincoln, Cheyenne, Kiowa, Otero and Prowers. In that year the eastern end of Las Animas County was set up as Baca County. Of the five large eastern counties found on the map in 1885 only Arapahoe had escaped division by 1889. The reason probably was the fact that the eastern end of Arapahoe contained no railroad "to develop the country or to pay taxes for new counties."⁵¹

Bright prospects in the "rain-belt" in the late 'eighties

⁵⁰ *Denver Republican*, January 1, 1888, p. 19.

⁵¹ Paxson, *op. cit.*, 212.

were followed by drought and depression in the early 'nineties. Crops planted in faith that rain would come shriveled and died. "Men lost hope and energy through repeated failures, and women and children endured weary years of poverty and hardships. Homes which represented the savings of a lifetime had to be abandoned. Whole counties were almost depopulated. What had been thriving towns were deserted."⁵² The suffering in this region was most acute perhaps in the terrible year of 1894. The prairie was parched and brown; there was not pasturage for stock; ponds and streams were dry. Many of those who were able to leave did so. Some borrowed money at ruinous rates of interest hoping that a change for the better would come soon. Eastern Colorado received a set-back from which it did not recover for fully ten years. In several eastern counties the population was greater in 1890 than in 1900. Washington County had a population of 2,301 in 1890 as against 1,241 in 1900; the number of people in Yuma County decreased from 2,596 to 1,729; the population of Phillips County dropped from 2,642 to 1,583; that of Sedgwick from 1,293 to 971; Kit Carson fell from 2,472 to 1,580. Baca County with a population of 759 in 1900 had about half as many inhabitants as it had had ten years earlier. The figures for 1900 were probably greater in all these counties than a census in 1895 would have shown.

The unfortunate people who had settled in this non-irrigable region had had a bitter experience. Some good came out of it, however, because both the federal government and the states of the semi-arid West began systematic investigations to determine what crops are best adapted to dry lands and what methods of cultivation are best to use. Drought-resistant crops, special tools, and special methods of cultivation were introduced. "Dry farming" having been put on a scientific basis, a new wave of settlement swept over the eastern plains of Colorado early in the twentieth century. Abandoned farms were reoccupied; dead towns came to life; new towns were started. Again

⁵² Elwood Mead, "The Relation of Irrigation to Dry Farming," in *Yearbook of Department of Agriculture*, 1905, 423; *Harper's Weekly*, January 12, 1895, contains a picture of a partially deserted town in eastern Colorado.

the census tells the story: Kit Carson's population of 1,580 in 1900 had grown to 7,483 in 1910. That this growth was warranted by conditions prevailing there is shown by the further increase to 8,915 in 1920. Phillips County contained 1,583 people in 1900, 3,179 in 1910 and 5,499 in 1920. The population of Yuma County increased nearly four hundred per cent between 1900 and 1910, or from 1,729 to 8,499.

Although Colorado was yet far from being industrialized, the 'eighties witnessed a significant growth in the size of the larger towns and cities of the state. The population of Denver increased nearly two hundred per cent in the decade ending in 1890; that of Pueblo, 663.4 per cent; of Colorado Springs, 163.6 per cent. The growth of the state stimulated manufacturing, and manufacturing plants attracted laborers. In Denver the chief industries were meat packing and the smelting and refining of metals. The Colorado Fuel and Iron Company established in Pueblo in 1880, was largely responsible for making that city the "Pittsburgh of the West."

Another part of the state in which there has been a marked increase in population in the recent period is the northwestern corner. The construction of the "Moffat Road" from Denver to Steamboat Springs in 1908, and its extension to Craig in 1913, opened to settlement a region rich in natural resources. Although the financial difficulties of the "Moffat Road" have prevented it from serving this region as much as had been hoped, it has nevertheless been a major factor in the development of Routt and Moffat counties. In 1880 the men who took the census found only 140 people in Routt County, then one of the largest in the state. In 1890 the number had increased to 2,369; in 1900 it was 3,661, while in 1910 it had grown to 7,561. In 1911 Moffat County was made out of the western end of Routt County. In 1920 the two together had a population of slightly more than fourteen thousand.

Turning to another corner of the state we find that the agricultural counties in the Arkansas Valley have likewise shown a consistent growth in population since 1890. Sugar beets, alfalfa and melons are among the staple crops in this part of the state. After Bent County had been greatly

reduced in size by the formation of Otero, Kiowa and Prowers counties in 1889, it could show only 1,313 inhabitants in 1890; the number had increased to 3,049 in 1900 and to 5,043 in 1910. Otero in 1890 was credited with 4,192 inhabitants; in 1900 with 11,522; in 1910 with 20,201. The figures for Prowers County are 1,969 in 1890, 3,766 in 1900 and 9,520 in 1910.

It is in the mining counties that the most noticeable decrease in population has taken place in the last thirty years. Since the 'nineties when Cripple Creek and Creede were names to conjure with, no mining excitement in Colorado has attracted general attention. N. C. Creede's discoveries of the Holy Moses and Ethel mines in 1890 led to a stampede to a region referred to at first as "King Solomon's Mines." At Creede were found all the romance, all the excitement, all the tawdriness of the typical mining camp. In 1892 Richard Harding Davis described it as a village of fresh pine:

There is not a brick, a painted front nor an awning in the whole town. It is like a city of fresh card-board, and the pine shanties seem to trust for support to the rocky sides of the gulch in which they have squeezed themselves. In the street are ox-teams, mules, men and donkeys loaded with ore, crowding each other familiarly, and sinking knee deep in the mud. Furniture and kegs of beer, bedding and canned provisions, clothing and half open packing cases, and piles of raw lumber are heaped up in front of the new stores—or those still to be built—stores of canvas only, stores with canvas tops and foundations of logs, and houses with the Leadville front, where the upper boards have been left square instead of following the sloping angle of the roof.

It is more like a circus-tent which has sprung up over night and which may be removed on the morrow, than a town, and you cannot but feel that the people about you are a part of the show.⁵³

In the case of Cripple Creek, several months followed Bob Womack's noisy and drunken announcement of his discovery of gold before much interest was manifested in a region which had been "prospected" so many times before. The rush did not set in until the autumn of 1891. By the spring of 1892 men began to realize and overstate the

⁵³ Davis, *The West from a Car Window*, 59-60.



UPPER: IDAHO SPRINGS. MIDDLE: LEADVILLE.
LOWER: SALIDA

wealth of a wonderfully rich mining district. Said the Colorado Springs *Evening Telegraph* in February, 1892:

The mineral belt grows larger every day and the deeper the holes go down, more and stronger indications make their appearance to convince the experienced that the camp is a world-beater and here to stay. Even if the bottom should drop out of every hole there would be enough free milling ore on the surface to keep thousands of men busy for years to come.⁵⁴

The discoveries at Creede led to the formation of Mineral County in 1893; Cripple Creek was responsible for the making of Teller County in 1899. In 1900 this new county had a population of twenty-nine thousand; ten years later it had decreased in numbers to 14,351; by 1920 it had suffered another decrease of fifty per cent, its population then being less than seven thousand. The Creede boom having passed, the population of Mineral County in 1900 was only about two thousand; in 1920 it contained fewer than eight hundred people. Likewise Gilpin, Clear Creek, Hinsdale, Lake, Ouray, Park, Pitkin and Summit, once flourishing mining counties, have shown decreases in population ranging from twenty to sixty per cent at each census since 1890. These cold, impersonal figures mean, when translated into more human terms, scores of deserted or decadent towns throughout the mountains. Nevada City, once a rival of Central and Black Hawk for pre-eminence in the region made famous by the discoveries of Gregory and Russell, is now as quiet as a city of the dead. Central City lives in the greatness of its past. Tincup had nine inhabitants in 1920; in Ophir—the fabulous riches of the Orient are suggested by that name—there were fifty-one people; Caribou had forty-seven; and so it went all through the hills. The old timers, though, are not without hope of a revival of the mining industry. They live by faith that a brighter day is coming.

The losses in the mountains have been made up on the plains, but there is still room for growth. With a total land area of 103,658 square miles, Colorado, with a popula-

⁵⁴ *Colorado Springs Evening Telegraph*, February 4, 1892; Mr. Robert Newman of Colorado Springs brought this reference to my attention.

tion of 939,629 in 1920, had on the average only 9.1 persons per square mile. Ten counties, Moffat, Rio Blanco, Jackson, Grand, Park, Gunnison, Saguache, Hinsdale, Mineral and Dolores, had fewer than two inhabitants per square mile. Twenty-two counties, Routt, Eagle, Summit, Garfield, Pitkin, Montrose, Ouray, San Miguel, San Juan, Montezuma, Archuleta, Costilla, Custer, Baca, Kiowa, Cheyenne, Kit Carson, Lincoln, Elbert, Douglas, Washington and Yuma, had between two and six per square mile. Exclusive of the city and county of Denver, only four counties in 1920 had as many as eighteen to forty-five inhabitants per square mile; those four were Boulder, El Paso, Pueblo and Otero.⁵⁵

The population of the state is divided almost evenly between urban and rural territory, and since 1900 there has been but slight variation in this distribution. Counting cities and towns of 2,500 and over as urban, 48.3 per cent of the people were found in urban territory in 1900; 50.7 per cent in 1910; 48.2 per cent in 1920. The center of population in Colorado has moved slightly to the north and east in the last fifty years. In 1880 it was in Park County, which is also the geographical center of the state; since 1890, save for 1900, it has been in Douglas County.⁵⁶

In recent years there has been a slight decrease in the percentage of foreign born white inhabitants, a result, probably, of the decline in mining. Mining camps were noted for the heterogeneous character of their population. The editor of the *Rocky Mountain Directory and Colorado Gazetteer* in writing about the inhabitants of Colorado in 1871 said:

As all classes of industry are represented, we have miners, mechanics, business and professional men, agriculturists, stock-raisers and wool-growers. These latter are mostly Americans, Englishmen and Mexicans. The miners, who are perhaps the most numerous class represent all nations, but, among these, Americans and Cornishmen are most numerous . . . One feature common to the miners of Colorado is unusual intelligence, for a laboring class.⁵⁷

⁵⁵ *Statistical Atlas of the United States*, 1924, 105.

⁵⁶ *Statistical Atlas of the United States*, 1924, 13.

⁵⁷ *The Rocky Mountain Directory and Colorado Gazetteer*, For 1871, 112.

According to the census for 1870 there were 6,599 foreign born in Colorado out of a total population of 39,864, or 16.5 per cent. In 1880 the foreign born amounted to 39,790 out of a total of 191,126, or 20 per cent. In 1900 the foreign born white population made up 16.8 per cent of the total; in 1910, 15.9 per cent; in 1920, 12.4 per cent.⁵⁸ In 1910 only three counties, Baca, Conejos and Costilla, had less than five per cent of foreign born whites in the total population. Of course, it must be remembered that in both Costilla and Conejos counties there are many Spanish speaking people who are native born American citizens. In 1920, in addition to the three counties named above, ten others, Moffat, Rio Blanco, Montezuma, Saguache, Rio Grande, Alamosa, Archuleta, Yuma, Kit Carson and Kiowa, had less than five per cent of their population in the class of foreign born. In 1910 between twenty-five and fifty per cent of the inhabitants of Gilpin, Clear Creek, Lake, Pitkin, Gunnison, Ouray, San Juan, San Miguel, and Dolores, all mountain or mining counties, were foreign born; in 1920 only San Juan and Lake remained in this group.⁵⁹

Superficially, at least, the settlement of Colorado has been accomplished—and within the span of one human life. Men and women still living have, in the words of Professor Frederick Jackson Turner, stood in the Rockies and watched “the procession of civilization, marching single file—the buffalo following the trail to the salt springs, the Indian, the fur-trader and hunter, the cattle raiser, the pioneer farmer—and the frontier has passed by.”⁶⁰

⁵⁸ *Fourteenth Census, Population, III*, 136.

⁵⁹ *Statistical Atlas of the United States*, 1924, 195.

⁶⁰ Turner, *The Frontier in American History*, 12.

CHAPTER IX

ORGANIZATION AND DEVELOPMENT OF COLORADO TERRITORY

Albert B. Sanford

PIONEERS AT MOUTH OF CHERRY CREEK—THE GREGORY DISCOVERY—MINERS' AND PEOPLE'S COURTS—"JEFFERSON TERRITORY"—CREATION OF COLORADO TERRITORY — GILPIN'S ADMINISTRATION — EVANS BECOMES GOVERNOR—STATEHOOD PROPOSED AND REJECTED 1864 — CUMMINGS' ADMINISTRATION — STATEHOOD ATTEMPTS OF 1866 AND 1867—HUNT AS GOVERNOR—RAILROAD TO DENVER—GOVERNOR McCOOK—GOVERNOR ELBERT—GOVERNOR ROUTT—COLORADO ACHIEVES STATEHOOD.

Reports of gold discoveries within the bounds of present Colorado resulted in the organization of prospecting parties in 1858. The largest and best equipped of these was the Russell party from Georgia. Others came during the summer and fall and sufficient gold was panned from the Platte and its tributaries to give rise to exaggerated stories of great wealth in the Pike's Peak Region.

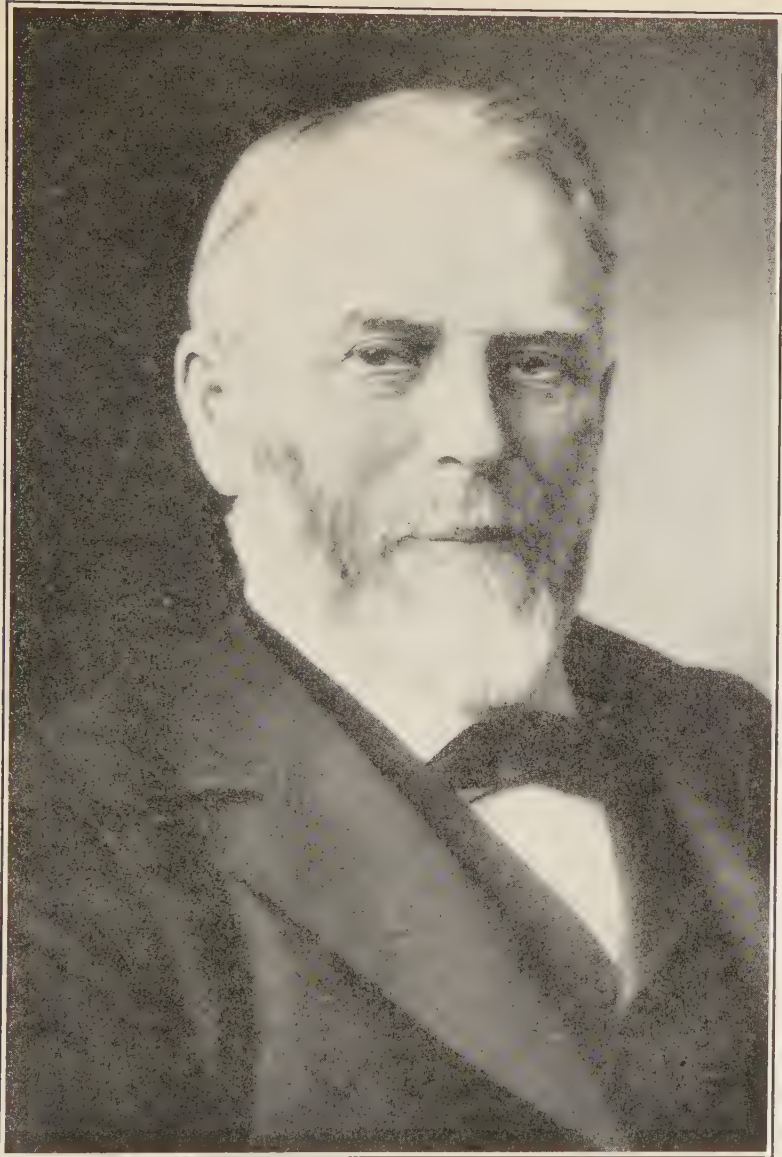
The men who stayed during the winter months probably did not number over two hundred, but they had great confidence in the country and its mineral possibilities. They expected a great influx of population the next spring and decided to take initial steps toward political organization. On November 6, 1858, they elected Hiram J. Graham a delegate to represent them at the national capital, and at the same time sent A. J. Smith to represent them in the Kansas legislature.

As early in the year 1859 as travel over the plains was possible, the population began to increase rapidly, for the reports of the previous season's activities, greatly exagger-

ated, had spread through the border territories and even to points far to the east. As spring advanced thousands of emigrants were on their way to the new Eldorado. These new arrivals knew little or nothing of the methods of washing gold although they lost little time after arrival in efforts to recover shining dust from the creek bed or from the unclaimed ground along the river, where they were graciously permitted to practice with the pan. Their first real discovery was that the golden sands of Cherry Creek had been but a dream, so far as remunerative pay was concerned, and that the limited enrichment of the river banks above and the channels of the dry creek tributaries were already staked and claimed by the first comers, and that at best, miners were not getting more than an average of two or three dollars for a hard day's work in the most favored localities. The general disappointment and disgust may be imagined. This feeling increased to a point that brought forth maledictions on the men who had spread the first reports, and all kinds of threats were made as to the fate of the guilty parties if they should be apprehended.

That the reports of gold were not without some foundation was evidenced in early April, when W. M. Slaughter wrote from "Dry Creek," twelve miles above its mouth, that eight to ten outfits were at work and that if sufficient water were available \$3 to \$8 a day to the man could be realized. Mr. R. P. Smith brought in \$42 in fine dust from diggings "three miles up Dry Creek from its mouth," or a mile or so above present Englewood. It is a fact that the area bounded by the Platte River from the mouth of Cherry Creek to near Littleton, thence southeast to where the Russells made their first pannings, and down to Denver is underlaid by a sand and gravel stratum that would pay to work in many places, were it not for the overlay of soil, and even today, more or less placering is carried on every season in this territory.

In spite of adverse reports carried by those who gave up and started back, there was an ever increasing stream of ox teams and some mule and horse outfits coming into the settlement until hundreds of camps were scattered along the creek and river banks. For want of space on the south side of the river, many began to cross the Platte on rough



WILLIAM N. BYERS

log ferry boats capable of carrying a team of horses or yoke of oxen with wagon, and established camps in less crowded places. Discouraged ones who were without other means of returning home made boats of whipsawed lumber and "sailed" from the settlement, willing to take chances on the swirling waters of the Platte. Of these "navigators" probably half reached the Missouri in from eight to ten days, but others were wrecked with all their baggage or stranded on sand bars below Fremont's Orchard.

Among those who paid no heed to the awful warnings of the "go backs" as he pushed steadily westward from Omaha, was William N. Byers, who carried with him a printing press, and a general supply of publishing materials, which he unloaded in Auraria on the 20th of April, 1859. Another man, John L. Merrick, had arrived a week earlier with a like equipment, but for some reason had not attempted to print a paper. On learning of Byers' arrival, and intentions, he got busy, and a race began to determine who should issue the first newspaper. Byers won by about thirty minutes in printing the first issue of the *Rocky Mountain News*. Merrick got out one issue of the *Cherry Creek Pioneer*. He never attempted a second and sold out to the *News* next day and left for the mountains.

At this time the district was considered by many to be a part of Arapahoe County, Kansas, and so, on March 28, 1859, an election was held to select county officers. However, others were not inclined to give allegiance to Kansas and favored the establishment of an independent government.

Up to this time nothing much had occurred to change matters for the better although reports of the finding of "gold quartz" specimens in the mountains were circulated and prediction was made by men of experience in California that ore of this kind would be discovered in lode deposits when snow disappeared from the hillsides. For some unaccountable reason there appeared to be less of disappointment and more of hope that, after all, a country with such a rich soil and abundance of water, and a vast unexplored mountain range stretching to the north and south, must have some advantages that so far had not appeared, and a considerable number of substantial cabins

were added to the first group constructed in the previous winter or very early in the spring, and every day witnessed new arrivals from "the states," until the population amounted to several thousand people.

Gilpin County has been fittingly called "The Cradle of Colorado." On that sixth day of May, 1859, when John Gregory drove his claim stake on the croppings, or apex, of a vein of decomposed quartz that was richly impregnated with gold, in what was later called Gregory Gulch, a branch of North Clear Creek near the present town of Black Hawk, the settlement at the mouth of Cherry Creek had nothing of a material nature to justify existence of more than a frontier trading post. Gregory and his two companions secured what ground they wanted and went down to Arapahoe Bar, about two miles below present Golden at the foot of Table Mountain, reported what they had discovered and exhibited dust and nuggets as proof of their story. It was twelve miles to Denver and someone, who was anxious to be the first to give the news, rode there as fast as his horse could travel. Within a few hours a stampede across the plain to the foot of the mountains was on. Almost instinctively men on horseback, others with teams and wagons, and still others plodding along with oxen, directed their way toward the mountain which had been described as the nearest to Gregory's camp.

Every hour brought additions to the population of Gregory Gulch, and every day new strikes were reported. Gulches were claimed to the very inch, and the hills bristled with claim stakes on lode claims. The country generally was well timbered with spruce and pine, and cabins were easily constructed, although many men lived in tents or in rude shelters of stone and pine boughs. With the trail broken, teams began to arrive with loads of provisions and mining necessities, and stores were opened anywhere the goods could be protected. It was an extremely busy spot and must have presented a picture of wild activity rarely equaled.

Naturally, conflicts arose between claimants, and other questions of vital importance were presented that related to personal rights, and even life itself. There were few if any law books among the belongings of this mass of human-



GENERAL JAMES WILLIAM DENVER

Taken at the age of 38, two years before Denver was named in his honor

ity, but there were men of knowledge and experience who saw the necessity of adoption of at least some rules and regulations at once. With a common impulse the people assembled in open air and declared that provision must be made for general protection by organization of districts, establishing their own laws and electing officers to enforce them under the direction of miners' courts. Our great law libraries, public and private, command our interest and respect, but recently as the writer was shown that old collection of the first law books of Gregory Gulch in the courthouse at Central City, all written with pen and ink, he was strongly impressed with the thought that these statutes, most of them clear and legible after nearly seventy years, meant to the pioneer exactly what they so plainly declared.

The laws, rules and regulations of one district did not vary much from others. Boundaries usually followed the center of well known gulches or along their divides, carefully described in detail and marked by stone monuments. Provision was made for the size of each claim, placer and lode, with amount of work necessary to hold; limitations on amount of water used and for its return to the natural channel within a specified distance. Failure to comply with laws governing labor and improvement on account of sickness or enforced journey to the "States," did not constitute grounds for cancellation when explanatory notice was posted in a conspicuous place on the claim. Many other exigencies were provided for. Evidences of lack of good faith on the part of a claimant amounted to quick forfeiture of rights, and attempts to defraud or deceive when duly proven, meant complete forfeiture of all property rights in the district, and deportation of the offender. The district officers consisted of a president, judge, recorder, assessor and sheriff. An especially interesting part of these old records was the detail in rules of procedure in civil cases. To move or deface a claim stake or landmark was punishable by a fine of fifty dollars, or practically three ounces of "dust." A person convicted of a theft above five dollars in value, or one guilty of perjury, got thirty-nine lashes on the bare back, confiscation of property and banishment from the district. A very few lines covered the punish-

ment for murder: "To be hanged by the neck until dead, dead, dead." Sanitary regulations were strict, and pollution of a stream or spring used for domestic purposes was subject to a fine of fifty dollars.

Every man charged with a crime or misdemeanor had the right to plead his own case before a judge or jury and an appeal from the verdict of a jury or ruling of a judge could be made to the "People's Court" which meant that every man in the district was summoned to a common place and the question of guilt or innocence voted on by ballot or by arranging themselves on one or the other side of a well defined line. All laws and district rules or regulations were adopted or amended by majority vote at mass meetings, and usually in the open air. The value of "retorted" gold was fixed at \$16 an ounce, and plain though fairly accurate balances were used at stores and frequently carried in the pocket along with buckskin pouches to hold the "dust" or nuggets. No county in Colorado has a better record as a law abiding community than what was later called "The little Kingdom of Gilpin," and many of its original regulations concerning water rights and mining claims were incorporated in territorial law in the session of 1862. Gilpin County was not alone in formation of miners' courts or in other pioneer protective organizations but it was the first.

Valley towns and districts did not have miners' courts but had practically the same thing in "People's Courts," and Vigilance Committees. These were guided in their verdicts by giving fair and impartial trials and could not be considered from any viewpoint as mob law, although many eastern journals referred to them as such. There is not a single case recorded where an innocent man was hanged by these organizations, hastily as sentence was passed in many instances; and few men who committed serious crimes ever got out of the country. Property was generally safe without lock and key, and any traveler in want was welcome to food and shelter. There were no insurance companies doing business in the country in early days, but misfortune of any kind was provided for by "passing the hat." With few if any doctors, there always seemed to be someone who could take care of an emergency case of sickness or accident. Personal differences in the mining districts were more

frequently settled by bare fists than by knife or revolver, and side arms were far more noticeable on visitors from the east than on the settlers.

Wootton's Hall (Auraria) was the first structure in the new settlement that could boast of a "second story." On April 11th there was held in this building a meeting of citizens representing the settlements of Denver City, Auraria, Arapahoe, Fountain City, Eldorado and El Paso, who adopted resolutions calling for a convention to be held in Denver City on May 7, 1859, for the purpose of preparing a state constitution to be submitted to the people on the first Monday in June following, and to call an election for state officers and representatives in Congress. They also adopted resolutions setting forth the peculiar conditions that fully justified the formation of a state. The boundaries proposed were the 37th and 43rd parallels and the 102d and the 110th meridians, which bounded an area including portions of the Territories of Washington, Nebraska, Kansas, Utah and New Mexico. Evidence, therefore, is not lacking that these men felt competent to assume responsibility for the local government of a very large territory. An outstanding feature of the preliminary convention of May 7, 1859, was an address to the citizens of the proposed state, by Messrs. Smith, McCoy, Castro, Russell and Winchester, from which the following is quoted:

Government of some kind we must have, and the question narrows itself down to this point: Shall it be the government of the knife and the revolver, or shall we unite in forming here in our golden country, among the gulches and ravines of the Rocky Mountains, and the fertile valleys of the Arkansas and the Plattes, a new and independent state?

It will thus be seen that we include within our limits all the material necessary not only to make a state, but a nation. With our mountains teeming with minerals and metals of every kind, our valleys richer for agricultural purposes than any part of the Union, with a population hardy as the hills they traverse, and barriers to divide us from the rest of the world, we may indeed feel free as the mountain air, which brings to us health and vigor.

On June 6, 1859, the regularly appointed delegates met, formed a permanent organization, named a committee to draft a state constitution, and adjourned until the first

Monday in August when one hundred and sixty-seven delegates assembled in Denver City, representing forty-five precincts. In this August convention sentiment was about equally divided between those favoring a state government and those advocating a territorial organization. It was finally decided to submit the question to a vote of citizens. This was accordingly done and in the election on September 5th the state proposition was defeated. Steps were now taken toward the organization of a territorial government. Delegates to a constitutional convention were elected October 3rd, and on the same day Beverly D. Williams was elected to represent the territory in Congress. The convention met in Denver City, October 10th. Proceedings were rapid and brief in adopting a constitution for the Territory of Jefferson. Officers were nominated as follows: for governor, R. W. Steele; secretary, L. W. Bliss; treasurer, George W. Cook; attorney-general, C. R. Bissell; chief justice, A. J. Allison; together with nominations for minor offices. These candidates united in an appeal to the people to embrace this means of civil security presented by the Provisional Convention.

"We, the people of the gold region of the Rocky Mountains, grateful to the Supreme Ruler of the Universe for His blessings, and feeling our dependence upon Him for the continuance of the same, do ordain and establish a free and independent government, to continue until such time as the Congress of the United States shall provide a government for us." This paragraph in the preamble of the constitution of Jefferson Territory sets forth in plainest of words, the intent and purposes of its founders. At the election on October 24, 1859, the Steele ticket was elected. The legislature convened on November 8th, when Governor Steele delivered his message. In this he reviewed the conditions leading to determination to establish a provisional government and made numerous and valuable suggestions as to necessary legislation. This original body of territorial law-makers remained in session until December 7th, when it adjourned *sine die*. A number of laws were enacted and the Steele administration was launched.

Opposition to the territorial government was not serious until the matter of tax collection was raised. Then open

resistance developed, especially in the mountain districts, some of the miners threatening to arm themselves against the tax officers who attempted to enforce the law. This encouraged the opposition in Auraria and Denver to declare that the laws of Kansas were the only sources of authority and protection and that substantially the Steele government amounted to open rebellion to the authority of the United States. However the legislature again convened on January 23rd in response to Steele's proclamation, and in the absence of Governor Steele, was presided over by Acting Governor Bliss. A number of resolutions were introduced but failed of passage. Among them was one authorizing the printing of the provisional laws and another praying Congress that the alternate sections of a strip of land twenty miles wide and extending from the Missouri River to Denver, be donated to the territory for the purpose of subsidizing a railroad. The only act that appears to have been enacted was one changing the name of Pike County to that of El Paso.

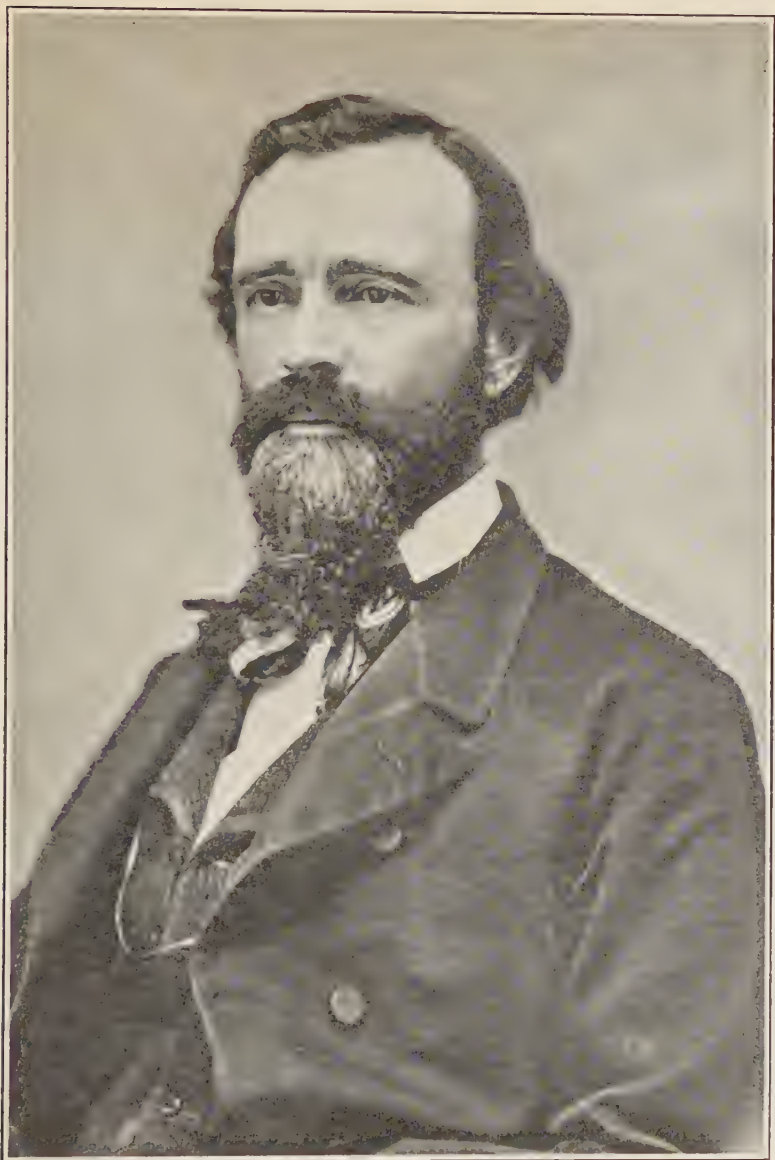
In March, word was received from Washington that President Buchanan had submitted to Congress, with favorable recommendation, the people's memorial praying for the establishment of a federal territory. Whatever comment may be made, the fact stands out clearly that the formation of Jefferson Territory was an expression from the very hearts of loyal American citizens attempting to secure some measure of protection to life and property until the national government recognized their just demands and established a regular government. As to the question of the jurisdiction of Kansas, it was pointed out by Jefferson supporters that under the provisions of the Kansas territorial act, approved by Congress May 30, 1854, the jurisdiction of Kansas did not extend over lands to which the Indian title had not been extinguished. That the Indian title had not been extinguished at this time could not be questioned. The government subsequently acquired the land from the Indians by formal treaty.

Among other territorial measures introduced in Congress as early as May, 1860, was a bill to create the Territory of Idaho, the name proposed for what later became Colorado, but, by reason of opposition from southern mem-

bers, this bill was tabled. The news of our territorial bill passing the House and of favorable chances for its being concurred in by the Senate, reached Denver on February 13, 1861. The bill became a law on February 28th, and Colorado Territory was a reality. A month later President Lincoln sent to the Senate a list of nominations for its officers headed by William Gilpin for governor. Colorado Territory was somewhat smaller than the proposed Jefferson Territory, and had the same boundaries as our present state. (See map of Jefferson and Colorado Territory.)

Governor Gilpin arrived in Denver on the afternoon of May 27, 1861, by overland coach. His reception was a hearty and enthusiastic one by the large crowd assembled at the Tremont House. Later a formal reception was tendered him at that hotel. The closest attention was paid to his address and great applause followed his word picture of what Colorado would be when its resources and advantages were known to the world. If there were among his hearers, any who looked upon him as a "tenderfoot" another impression was gained when he declared that he had "camped on the site of Denver, nearly eighteen years before." It was his military training, his experience in the mountain country, and his enthusiasm for the West that induced Lincoln to select him as our first governor. Nothing relating to his local reception was more cordial than "Governor" Steele's greeting, and probably more as a mark of respect than from any necessity, Steele issued a proclamation declaring the provisional government at an end, and calling on all to support the new executive and to be loyal to the United States.

With the news of the fall of Fort Sumter, evidences of a division of sentiment among the inhabitants of the territory appeared, more especially in Denver than the mountain and valley towns. This seemed sufficiently strong to warrant the raising of a Confederate flag on the store of Wallingford and Murphy in Denver. It did not remain long, however, for Sam Logan, later an officer in the First Colorado Regiment, tore it down, and his act was so enthusiastically applauded that thereafter supporters of that emblem quieted down and many left at once to join the Southern army. Central City was the first town to raise a company



WILLIAM GILPIN, FIRST GOVERNOR OF COLORADO TERRITORY

of volunteers and offer its services to the government. Indeed the war spirit in that place and Boulder County, and other mountain districts was so active that miners began to abandon their sluices and shafts and enlist here or leave for their homes in the "States" to join the army there. This condition was soon reflected in Denver, where the absence of the miners with their well filled pouches of gold dust affected business. Whatever may have remained of political or factional strife among the people appears to have been wiped out over night. Mass meetings were common all over the territory and resolutions of loyalty to the Union were unanimously adopted.

In July Governor Gilpin announced the boundaries of the judicial districts of the territory. Supreme Court Justice Hall arrived about this time and with Judge Pettis as Associate Justice, opened the first sessions of court. Rules of procedure were adopted and a few days later rulings were announced on certain questions which had been submitted by the territorial bar. Justice Hall at this time appointed A. A. Bradford of Pueblo, a town of considerable importance by this time, as commissioner for the Second District.

H. P. Bennet was nominated as delegate to Congress by the republican party, while the "People's Convention" nominated B. D. Williams for the same office. It soon became evident that Williams' warmest supporters were among the element known to hold sympathies for the South, and Bennet easily defeated him in the election following a campaign on the sole issue of "For or Against Lincoln."

Very early in September a report reached Denver that a body of Texas Rangers had captured forts on the Rio Grande below Santa Fé and were headed north. Gilpin saw the extreme gravity of the situation and began preparation to resist the threatened invasion. Materials and supplies were purchased by "Gilpin drafts" on the treasury at Washington, and troops were enlisted for a Colorado regiment.

The first session of a Colorado legislature convened on September 11, 1861, and was composed of a House of Representatives and a Council, or Senate. The council chamber was located in a building on the corner of Larimer and

16th streets, now occupied by the McClintock Block, while the House was provided with quarters adjoining the post office, then on Larimer between 15th and 16th streets. Gilpin's message to the assembly is mentioned as "one of beauty in general style and covering all matters of present interest."

With hundreds of volunteers arriving in Denver and finding camp grounds near town lacking much in details for soldiers' convenience and comfort, need of permanent barracks was apparent to Gilpin, and after inspecting several sites proposed, he selected one near the bank of the Platte River about a mile southwest of the town. Building operations were commenced at once, and barracks costing over \$40,000 were provided in a short time. When the troops took possession, Camp Weld,¹ as it was named, became a scene of interesting military drills and parades and a popular place for entertainments and dancing parties. By the middle of October the first regiment was filled and need of another was discussed. Gilpin's rapid and effective work in organization was approved by all loyal citizens. Among his captains and lieutenants were men who had stood for law and order when the only means of securing it was the Miners' Courts and the quick operations of the Vigilance Committees.

Among the Southern men in Colorado at this time were many who had formed strong friendships with men of Northern birth and who had shared with them the hardships of pioneer miners and faced many forms of danger together. These men, unless they had made themselves objectionable by radical expressions, were generally respected and there were many sad partings between them and their Northern brothers, when one was to stay here and the other quietly depart for his Southern home. An instance may be cited of the Russell brothers who came from Georgia in 1858 and recovered the first placer gold near Denver. They were among the first to reach Gregory

¹ The only building left of the original barracks still stands on the corner of West 8th Avenue and Vallejo Street, owned and occupied by Mr. James Millison, whose father claimed the ground after the close of the war.

Gulch and to discover the richness of what is still called Russell Gulch, south of Central City. At the beginning of the war, they were working their sluices there and had accumulated a considerable quantity of gold dust. There is nothing of record to indicate that their natural sympathies for the South had been expressed by word or deed, but suddenly they were arrested, confined in a jail and their gold taken from them. The local sentiment for fair play was so strong that they were shortly afterward released, their gold returned to them and an escort provided to see them safely into the South Park country.

Aside from some comment among business men in the territory on what seemed an unnecessary delay in returns from Gilpin's sight drafts, which was at first supposed to be due to congested conditions in the treasury department, no serious concern developed until October, when lack of currency was felt to such an extent that Gilpin was urged to do something to relieve the situation. He could not give a satisfactory reason why payment had not been made, and as every day made matters worse, S. S. Curtis was dispatched to Washington as a general representative of the business men. Without awaiting report from him, a public meeting was called and Captain Alley, a government agent, was asked to give some light on the matter. Nothing came from this effort and Gilpin was sent for to appear and advise as to what might be done to avert a general financial collapse. Inquiry at his home resulted in the announcement that the governor had left for the East. His strongest supporters were deeply disappointed in this action, and beyond a doubt he committed a grave error in not taking the people into his entire confidence and deferring his departure until as full an explanation as possible had been publicly made and his intended trip to Washington announced. Public sentiment was aroused to such a point by the next day that a petition was circulated in Denver asking President Lincoln to remove Gilpin and appoint in his stead, General Larimer, who had been prominent in the first legislative assembly and was one of the founders of Denver City.

To add to Denver's ill humor over financial matters, the announcement was made on November 6, 1861, that by a

vote of seven to six, the capital had been located at Colorado City. With about \$375,000 of Colorado money tied up in Gilpin drafts, the winter months were hard to endure but with the announcement from Jerome B. Chaffee at Washington about February 10th, that the drafts which Secretary Chase had repudiated would be paid, Colorado's financial atmosphere cleared overnight. Gilpin returned on March 8th, as suddenly as he had left and to some extent regained public confidence though it was declared by friends of Bennet, Byers and Chaffee who had been in Washington conferring with treasury officials, that to them belonged the credit of securing a settlement. Whoever was responsible for the changed attitude of the government is of little importance compared with the results of Gilpin's course. A more conservative man than he would have doubtless waited until full official authority had been secured. The morale of the enthusiastic volunteers would have been dangerously impaired had actual necessities of food, clothing and other equipment not been furnished. One week before Gilpin's return, the regiment he organized left for Fort Union, New Mexico, and in less than a month thereafter, they had met and defeated the Confederate forces at Apache Cañon and Glorietta, and Gilpin's "Pet Lambs" covered themselves and the territory with glory.

A brief telegram received on March 29, 1862, announced the removal of Gilpin and the appointment of Dr. John Evans of Chicago, as his successor. It is something of a coincidence that the order for Gilpin's removal was issued on the same day his regiment began the battle with Sibley's army. Secretary Weld was dismissed with his chief, and Samuel H. Elbert was appointed in his place. Governor Evans arrived by the regular overland coach on May 24, 1862, and again the old Tremont House was the scene of a governor's reception. With the arrival of the "greenbacks" to take up the drafts, Major Fillmore, U. S. Paymaster, and his assistants were busy from morning till night in making payments, and a material improvement in business immediately followed.

The second session of the legislature met in Colorado City on July 7, 1862, but after organizing, adjourned to Denver where it re-convened on the 16th, and continued to

August 15th. On July 24th, Governor Evans addressed the joint assembly and gave evidence of his having made a deep study of general conditions and needs of the territory during his brief residence, and made some very practical recommendations as to legislation. At this time Captain Berthoud had surveyed the proposed route of the Pacific railroad over the pass now bearing his name, but had not made report. Governor Evans expressed his hope that results would justify this route over the Rocky Mountains, which would mean the passage of the railroad through Denver.

In the fall campaign of 1862, H. P. Bennet, William Gilpin and Colonel Francisco were candidates for Congress. Bennet was easily elected, for his services to the territory had been very satisfactory.

Evans at this time had been to Chicago and presented arguments in favor of the Berthoud Pass route for the Pacific railroad, and Chicago papers made such favorable comment that it amounted almost to indorsement of his views. In the meantime the governor brought his family from their eastern home and took winter quarters at the Tremont. With his time so largely employed in watching the Indian situation, fighting for the Berthoud Pass route and attending to the routine duties of executive, we nevertheless find him urging a seminary for Denver and heading a cash subscription with \$500 toward its initial expense, Colonel Chivington following him with a like amount.

The First Colorado Regiment reached Denver after a year's absence, on January 14, 1863, and the whole community and outlying districts joined in giving them the reception due the fighters, and the *News* said of them, "They are soiled and travel worn, and their ranks have been thinned by Texan battles and sickness, but they still look as if they might deal death and destruction to the foe at a moment's notice."

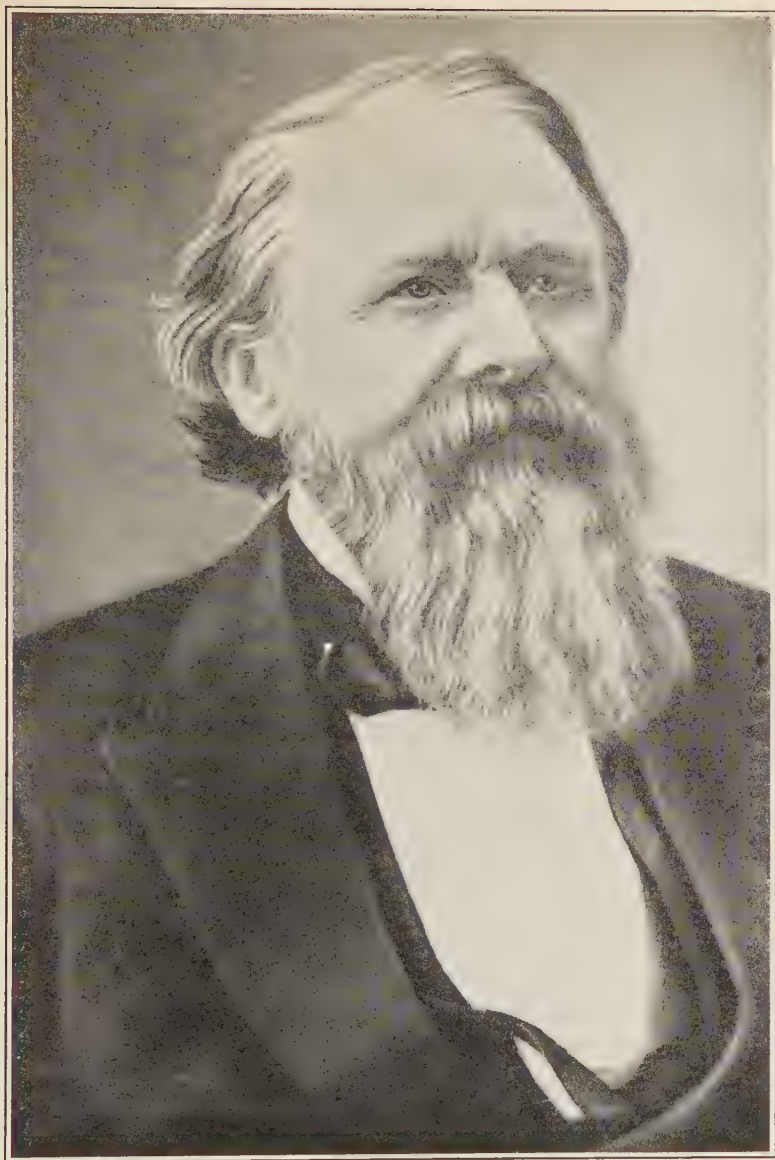
The capital having been moved from Colorado City to Golden, the third session of the legislature met there on February 1, 1863. After organization and after Governor Evans had delivered his message, the body adjourned to Denver where it met on the 5th. To Captain Sopris had been given the task of providing room for the law makers.

The court room on Ferry (now 11th street) was prepared for the House, and another building on Larimer near at hand was fitted up for the Council. This session lasted until March 12th, when it adjourned without removing the capital from Golden.

On the 24th of February, 1864, news came that Congress had passed an act providing for a Colorado state government. Governor Evans at once issued a proclamation calling for an election to select delegates for a Constitutional Convention. This body met in Golden on July 4th, adjourned to Denver and commenced their deliberations on the 6th. Sessions were held daily until the 11th when it adjourned *sine die*. The constitution adopted was a document that appeared to cover all the requirements and the thirty-one delegates were highly praised for the result of their efforts. But the population of Colorado was as yet rather small and the people were not ready to assume the obligations of statehood. Accordingly when the constitution was submitted to the vote of the citizens of the territory it was defeated by a substantial majority.

As the government reports of gold production in the western country began to show large gains and the mineral wealth of the mountains began to be understood, a sentiment arose in the East that resulted in the introduction of a bill in Congress to tax the product of the miner and to prevent further acquisition of title to mines by discoverers. Provision was "generously" made to give the miner preference in securing a lease on what he might find, but ownership of the fruits of his hard work must rest in the government. This bill was dignified by the name of "Seigniorage Act," whatever that meant. Naturally a storm of protest arose all over the mining region and active opposition against its passage commenced in Washington. Colorado was justly pleased to hear that through the influence and fighting qualities of Chaffee, Bennet, Evans and others of her own people, the measure was defeated.

Indian difficulties that had been threatening for some time developed in the summer of 1864 into a general uprising of the Plains tribes. The routes of travel to Colorado were closed and numerous outrages were committed on citizens of the territory. This wholesale uprising (treated



John Evans

in a previous chapter) entailed great suffering and hardship upon the pioneers who were establishing their homes in this new land.

While in Washington in the winter of 1864-65 Governor Evans presented a memorial to Congress, asking, for Colorado, satisfaction of miners' titles, appropriation for Capitol and Penitentiary buildings, indemnity to sufferers from losses resulting from Indian raids, and for expense of holding the late Constitutional Convention. He also asked the War Department to plan for a winter's campaign against the Indians. (This suggestion had been made by Kit Carson.)

During Evans' absence, Acting Governor Elbert occupied the executive office and on January 10, 1865, delivered his message to the fourth session of the legislature. On his return from Golden, Elbert was advised of more very recent killings of emigrants and settlers and increasing danger to all the country north and east of Denver, and wired Governor Evans at Washington: "The Federal government must help or give up the country to the Indians." Travel over the plains ceased, with the exception of large and well armed trains, and settlers gathered in or near forts or well protected stations.

On April 15, 1865, the single wire stretching from Julesburg to Denver carried the message of Lincoln's assassination. Perhaps nothing more in brief could describe the effect on the people than a paragraph in one of the local papers: "The bells toll our national calamity; business houses are barred; en masse the people salute one another in tears—all as fellow mourners over a mutual friend." From Denver the fastest riders sped away to the mountain towns and near valley points carrying the sad news to inhabitants, and there was not a town, settlement or stage station that did not evidence its sorrow. Business blocks were soon heavily draped, people crowded the churches to hear ministers discourse on the life and death of the President. Acting Governor Elbert announced the 19th of April "to be a day of humiliation and prayer," and on the 20th, Denver's tribute of love and respect was expressed by the marching of mourning citizens through the streets to the Denver Theatre, where Reverend H. B. Hitchings deliv-

ered the funeral address. With only about a third of the crowd securing admittance to the building, the remaining hundreds stood outside in the street with uncovered heads during the entire service.

Shortly before his assassination Lincoln, in bidding Speaker Colfax goodbye, and knowing of his early departure for an extended western trip, gave him what was his last public message: "Say to the miners out there in the mountains that I am for them and will promote their interests to the best of my ability. You know, Colfax, that I have some very large ideas of the wealth of our western country for I believe we will yet be able to show that we are the treasury of the world." A short time later, Colfax stood on a rude platform in Central City and gave an assembly of seven thousand miners this message of encouragement, and personal interest.

Report of the intended removal of Governor Evans reached Denver on June 15th, and on the 19th details of what led up to this action by President Johnson, were published in Denver papers. In this it appears among other things, that a sharp division of opinion, as to some mining legislation between the Governor and Delegate Bennet, Judge Bradford and other Colorado men had resulted in a specific complaint being filed with Judge Usher, Secretary of the Interior. Whatever of effect this opposition may have had, it was strongly backed by the adverse eastern sentiment against Evans by reason of the Sand Creek affair. In fact the Chivington Investigation Committee made particular recommendation for his removal. On September 4th, Governor Evans sent his resignation to President Johnson and announcement was at once made of the appointment of his successor, General Alexander Cummings of Philadelphia.

Colonel Butterfield was one of the leading stage men of those days and, on September 23, 1865, accompanied the first coach to Denver, via the Smoky Hill Route. So enthusiastic were the citizens over the completion of the "Short Line" that they met the Colonel four miles up Cherry Creek, "forcibly" removed him from his coach, set him beside Mayor Clark in the official carriage and, headed by a brass band, drove into town and to the Planters House, where

Butterfield addressed a large crowd and promised a very much improved service to the Missouri River.

Governor Cummings assumed duties of his office on October 17, 1865. Unlike the receptions accorded Gilpin and Evans, his arrival had hardly been noticed. The people were more interested in the coming election for "state" officers than they were in a mere territorial governor. Evans had been so universally popular that anyone who might have been named as his successor could not have expected much in the way of public reception. Native western courtesy was not lacking however, and a noticeable disposition on the part of the public to be more gracious resulted after Cummings' return from an extended trip through the mining regions, where he left a very good impression. Even the *News* acknowledged that owing to political matters absorbing so much interest, he had possibly been neglected and expressed its good wishes in a short editorial. A study of the portrait of Governor Cummings, that hangs in the State Museum, will convince the observer that Governor Cummings was anything but a weakling, and, it is quite probable, had he occupied a different position in the peculiar situation that existed at that time, he would have proven one of the territory's popular governors.

Although the "state" constitution had been defeated in 1864, champions of statehood for Colorado were not disheartened. In 1865 they made another concerted effort and the constitution then framed was adopted by a small majority in September. This statehood activity was presumably taken under the enabling act of the previous year and there was doubt as to whether the action would now be considered legal. Those favoring statehood were confident that Congress and the President would ratify the local proceedings and so proceeded to set up the state machinery. A governor and state legislature were duly elected and on December 12th the legislative body assembled at Golden.

We see Gilpin, who had been deposed in disgrace, his acts of pure patriotism, however technically unauthorized they may have been, repudiated by the government he sought to serve, standing before this representative body of a "sovereign state" and addressing them as "Governor of

the State of Colorado." With his natural disposition to soar in visualizing the Colorado of the future, he did not lose sight of the practical things of the present, and then and there virtually mapped out the routes for railroads in the state that are followed today by the branch lines of the Denver and Rio Grande and Colorado and Southern roads. He declared there would be a great line of railroad from Denver south to the City of Mexico and predicted the beginning of its construction as one of the things not far distant. Indeed his railroad suggestions and forecasts attracted considerable attention in the East, and the *Philadelphia North American* in an issue shortly afterward called attention to the new state of Colorado, and said, "It has hardly broken its egg, not half surveyed within its own limits, knows what hostile Indians are, yet looks forward to something more than stage communication. * * * If these people, the very children of the family stretch out their hands to such deeds, it cannot fail that a new cycle of greater industry and wealth lies before us. If Colorado plans this, what may we not plan."

On the 18th, the local newspapers carried headlines that must have been printed with specially ordered type sawed out at a planing mill, judging from the size. "THE BATTLE OVER," "VICTORY IS OURS," "CHAFFEE AND EVANS ARE UNITED STATES SENATORS," were among the allusions to the election of former Governor John Evans and Jerome B. Chaffee to the United States Senate by the legislature. Then, after passing some resolutions and adopting rules, adjournment was taken subject to the call of the "Governor." On the 21st, Evans and Chaffee, senators-elect, and Chilcott, who had been duly elected as Member of Congress, said goodbye to a host of wildly enthusiastic citizens at the corner of 15th and Market streets, and climbed into a special overland coach to begin the long journey to Washington.

A few days before, Governor Cummings had, by proclamation, announced the names of members of the Territorial House and Council elected on September 12th, and on December 22nd another was issued in which he called attention to the uncertainty of the necessary Congressional action in the matter of Colorado's statehood situation, for

the reason that a vast amount of business of the most vital importance to the nation demanded consideration above everything else and that until such action was taken "the only authority rested in territorial officers," and urged the regularly elected members of the legislature to disregard what appeared to be an attempt to destroy their functions.

The territorial legislature met in Golden on January 1st, but as usual adjourned to Denver the following day and convened on the 4th. Territorial Secretary Elbert, whose patience in moving legislative furniture back and forth between Denver and Golden had been tried to the limit, declared that "the first railroad needed in Colorado was the most direct line between its two capitals." Cummings' message to the legislature was highly pleasing to his friends and considerable of a surprise to his political enemies, for it carried recommendations clearly indicating his intimate knowledge of the conditions then existing in the territory. One newspaper not wholly satisfied with his appointment was fair enough to say that "every word weighed a pound." Now an incident happened that was of little importance in itself, but with spark-and-tinder effect, was the beginning of one of Colorado's most bitter political fights. A controversy arose between Secretary Elbert and the Governor over the official possession of the territorial seal. Details cannot be followed, but within a short time lines of conflict between Cummings, Hunt, Teller and others on the one side, and the Evans and Elbert forces on the other, were sharply drawn and beyond doubt the result of this political feud delayed Colorado's admission for a decade.

The "state constitution" provided for but one qualification of voters, granting the franchise to white male citizens over twenty-one years of age. The negro population protested against this by appealing direct to Cummings who at once called the attention of the legislature to the subject and recommended enactment of laws giving them the privilege to vote.

In the latter part of January Senators Evans and Chaffee called on President Johnson and presented a petition from Colorado citizens asking for an executive proclamation declaring the territory a state. After a review of the matter he said, "The proceedings in the second instance

having differed in time and mode from those specified in the Act of March 21, 1864, I decline to issue the proclamation and will submit the question for consideration and further action of Congress." Chaffee and Evans together with other prominent Coloradoans immediately transferred their activities to New York and commenced a campaign along other lines.

The mines were turning out large amounts of gold bullion and the problems of smelting refractory ores had been practically solved by such men as Keith and Lyon² at Black Hawk and other earnest investigators in Georgetown, Boulder County and the Breckenridge districts. Indeed, the first bar of gold and silver bullion ever produced in the territory had been recently turned out at the Lyon Smelter, recovered from the heavy sulphides of the Gregory, with a coin value of \$3,240, but worth \$4,698 in "greenbacks." There is little question that such material evidences of the mineral wealth, together with favorable reports from other industrial undertakings then under way, had much to do with securing the favor of Wall Street.

News of the passage of the Colorado statehood bill by both houses of Congress came May 4, 1866. Two days before, Governor Cummings had left for the East, and Frank Hall, territorial secretary, became acting governor and was destined to play an important political part in the remaining territorial period. In the meantime people were anxiously awaiting the approval of President Johnson. Two weeks passed when a brief telegram announced his veto on the grounds of insufficient population. Johnson was denounced from all quarters of the territory and open threats were made against Cummings, should he return, for appearances indicated responsibility of Johnson's action rested largely on his shoulders. Cummings was a man who could feel the sting of rebuke without an explosion of anger. Johnson had his own views on Southern reconstruction, and had Cummings or any other well posted man on Colorado affairs pointed out but one thing to him as an objection to the statehood bill, that of constitutional pro-

² Geo. M. Pullman, later of palace car fame, was associated with Lyon.

vision against Negro franchise, it would have been sufficient from his partisan view to kill the measure by his veto. The *New York Times* of August 24, 1866, is quoted on this specific subject: "The President sent for Evans and Chaffee and advised them if they would sign an endorsement of his policy on national affairs he would not veto the Colorado bill. Both flatly refused and the veto followed."

In the fall campaign, 1866, A. C. Hunt and George M. Chilcott were candidates for Congress. Chilcott was supported by the state, and Hunt was favored by anti-state forces. Result of the election was announced officially early in September, when the Territorial Canvassing Board reported Chilcott's majority over Hunt at 108. Hunt presented affidavits from several southern counties showing that votes for himself had been illegally counted for Chilcott. These affidavits were not admitted by the board, whereupon Cummings, who had returned early in August and had not been, by the way, subjected to threatened indignities, brought the proceedings to a close by saying, "Gentlemen, I shall give the certificates of election to Mr. Hunt. That is decisive." Then the contestants gathered up the soiled linen for the consideration of the House Committee on Elections at Washington.

With statehood denied and Indians still on the warpath in remote sections, with great damage to farmers from clouds of grasshoppers descending on crops nearly ready to harvest, with the gulch placers producing but a fraction of the gold of earlier times, and reduction of refractory ores by smelting only commenced, Colorado was quite unprepared for the news that the Pacific Railroad had finally and definitely adopted the northern route and would build directly west from Julesburg, and if connection by rail with the outside world was desired by Colorado, it could only come from construction of a branch line north from Denver or Golden. These were probably the gloomiest days in Colorado's history, and only an Evans or a Gilpin could see through the obscuring clouds a line of railroads running north and south along the base of the mountains, other lines crossing the plains on a direct course to the Pacific, and a network of branches connecting mining and

agricultural districts. Only a Byers or a Hunt, with intimate knowledge of the extent and richness of the natural resources, could know that in due time these factors would attract a great population and millions of capital.

Somehow and in some way the people did not lose faith in themselves or their communities. Along the fertile valleys of the Boulder, St. Vrain, Big Thompson and Cache la Poudre to the north, farmers began to increase their acreage of production by digging new ditches or enlarging small ones. Primeval log cabins gave way to more commodious frame dwellings. This was also true along the Platte to the Cañon, while even greater effort was undertaken on the Arkansas from Cañon City to Bent's Fort. In the mountain districts, valleys and parks, raising of the hardier grains and vegetables had been successful and large areas of native meadows were being enclosed for hay farms, and in each and all of these districts, including parts of the great San Luis Valley, cattle raising and farming gave promise of the wonderful development that followed. General industrial depression in Colorado has always been followed by the increased effort to locate mineral deposits, and at this time, when rich silver and lead mines had been opened up in Clear Creek, Boulder and Summit counties, prospectors who were unable to provide for themselves were grubstaked and scattered all over the country.

Whatever Cummings' enemies may have charged him with, his personal and moral courage was never questioned. The Legislature met on December 3, 1866, and listened with marked respect to his message. In this he pointed out the danger to the mining interests of the territory that would result unless the sale of worthless mining stocks or mining claims was not checked. Investors at that time were eager to enter the field and numerous instances had occurred where fraud and deception had been successfully practiced by unprincipled promoters. He looked with much hope on the results so far secured in the treatment of refractory ores, noted the splendid progress of farming and stock raising, and expressed his confidence in the future. He declared that before Colorado could hope to become a state, the provision against Negro suffrage must be repealed. He called attention to Golden's being the legal

capital of Colorado, but said that the law designating it as such had been a dead letter.

Late in January, 1867, another bill passed by Congress for the admission of Colorado was vetoed by President Johnson, who, in addition to his former reasons of objection, added that of his disapproval of that part of the constitution denying Negroes the right to vote. An almost successful attempt to pass the bill over his veto was made in Congress, but failed by three votes. Evans, Chaffee and others who had been in Washington the greater part of the year gave up the fight and came home.

The Chilcott-Hunt contest for congressional delegate ended quite suddenly a little later, when Chilcott was sworn in as a "sitting delegate," which meant he was subject to whatever the Committee on Elections might do to him. He and Hunt had been close personal friends in early days and were never very far apart outside the committee rooms during the entire contest.

At a general election Colorado voted for "impartial suffrage," and what had been a millstone around its neck was dropped, and in the spring election following, colored men voted for the first time.

Cummings had gone East early in the year, and little was heard of Colorado affairs at Washington until April 24th, when President Johnson announced the appointment of Governor Cummings of Colorado as collector of internal revenue for the Fourth District of Pennsylvania. Frank Hall's friends in the territory immediately hailed him as governor *de facto* until Congress again convened. Rumors as to Cummings' successor rather centered on Hunt, and his abandonment of the fight for Congress was pointed out as a strong indication that he had been satisfied by promise of the governorship. The *New York Times* of May 13, 1867, carried a brief announcement that A. C. Hunt had been appointed and was leaving at once for his post in Denver. Hunt's home was then in West Denver, in the center of what is now Lincoln Park.

On the very day of his inauguration, Hunt was confronted with the immediate necessity of providing means for protection against a new uprising of Indians on the plains. Troops were raised and in due time the Indians

were driven back, but not without the death of many white men and capture of women and girls and destruction of a large amount of property. Central City raised a cash fund of \$5,000 to pay for Indian scalps at \$20 a head. Hal Sayre, still living in Denver, was adjutant general under Hunt during this period and gained a lasting reputation for ability and speed in organizing the volunteer troops. For the first time the Utes showed a disposition to be inclined to join the plains tribes and many complaints came in from up the Platte, along Cherry Creek and Plum Creek of their insolence and threats. Many pages could be written of the almost constant necessity for guarding by settlers during this time and in the following year, but at best no effort can fully tell the story of the ever-present danger our pioneers faced in staying on their ranches and protecting their lives and property against the Indians.

The first indication of Denver's securing a branch line from the Union Pacific, then building west from Julesburg, was the meeting of citizens with James Archer in the office of Gen. Bela M. Hughes, in Denver, on November 9, 1867. A committee was named to initiate efforts to secure a government subsidy, and organization of the Denver Board of Trade was completed. Mass meetings followed on several occasions and speakers roused enthusiasm in discussing the advantages the territory would derive from construction of a railroad to Denver and outlined the extensions that would necessarily follow into southern and western districts. At one of these meetings Former Governor Evans predicted several distinct lines into the mountains and Bela M. Hughes presented an array of facts and figures on cost of the initial line. When the Denver Pacific company was organized, even mountain papers, none too friendly toward Denver at that time, rejoiced with her and Summit County, and in addition to its congratulations sent down its first ton of silver bricks produced from a local smelter. Cheyenne wired to the railroad committee, "Put us down for a good block of Denver Pacific stock;" whereupon the paper in Denver expressed its hearty appreciation by saying, "This is generous from our neighbor, The Magic City of the North."

The seventh session of the Legislature met in Golden

on December 2, 1867. A bill was introduced on the 7th, and passed on the 9th, that removed the capital to Denver. On the afternoon of that day carriages were furnished by the citizens to carry the members to Denver. Here it continued until adjournment taken on January 10, 1868.

The legislative committee appointed to select a site for the capitol reported their choice as a "point on the bluffs between F and G streets (Fifteenth and Sixteenth), just south of the residence of Alex Steel, to be donated by Henry C. Brown." The sloping lawn from the front of the present building west toward the Civic Center is all that might remind one of the "bluffs" mentioned. Another committee selected the site for the penitentiary, which was described as "a tract of land comprising some thirty acres adjoining the Town of Canon City, on the Arkansas River."

Early in February, 1868, a delegation of Ute chiefs, accompanied by Indian Agents Head and Oakes, Kit Carson, Colonel Boone, and Judge Bennet, were introduced to the President of the United States by Governor Hunt. Just what sort of an opinion the Indians formed of "Great Father" Johnson is not recorded, but an agreement was reached with them at that time to vacate their old hunting grounds in Colorado east of the Continental Divide and occupy reservations to the west. The entire party, excepting Bennet, who remained to arrange some details of the treaty to be submitted to the Senate, came West by rail to Cheyenne and from there to Denver by coach.

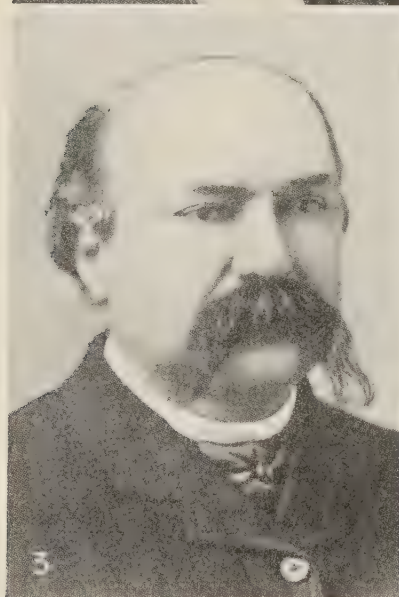
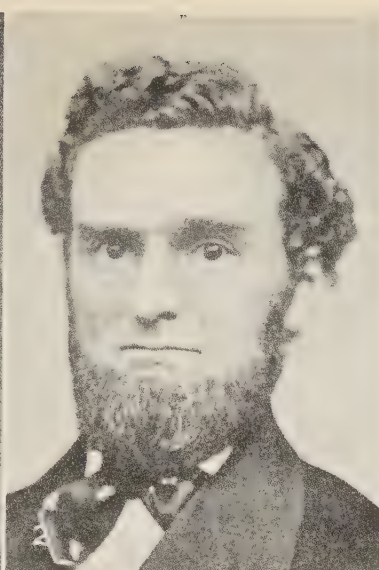
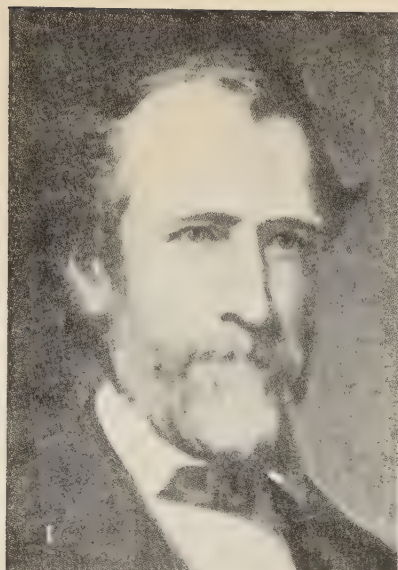
General Grant, accompanied by Generals Sherman and Dent and Major-General Sheridan, arrived in Denver over the Smoky Hill route on April 21, 1868. There was little in the way of a formal reception, but every courtesy was shown the distinguished guests, who were urged "just to make themselves at home."

In August another party of notables came to Colorado—Schuyler Colfax, Samuel Bowles of the *Springfield Republican*, and Governor Bross of Illinois. On the 24th these visitors, accompanied by Governor Hunt and a large party of Denver men, with their wives and young lady guests, started for a camping trip in the mountains along the Arkansas west of South Park. Two or three days later the operator at Colorado City wired Secretary Hall that a

large party of Arapahoe warriors had passed into the mountains on their way to the Park. Hall immediately sent runners to warn the Denver party of their danger. Anxiety for their safety was greatly increased by the arrival of the bodies of a woman and her boy who had been murdered and scalped by the Indians on Kiowa Creek, southeast of Denver. Hall called for volunteers, and a strong party was dispatched to the Kiowa region. The runner sent out by Hall found the Colfax party in camp on the Arkansas River in the vicinity of present Buena Vista, but Hunt, already notified of the approaching Arapahoes, had dispatched a trusted messenger to the camp of a large party of Utes some twenty miles away, with a request for help. Instant action was ordered by the Ute chief to assemble a war party who hurried to the white men's camp and remained with them until they started for Denver. On the return journey twenty picked braves accompanied the party back to Denver.

On his return to Washington, Colfax, who was then a candidate on the republican ticket for vice president, stirred things up by open condemnation of the Government policy being pursued in handling the hostile Indians and was quoted by a Washington correspondent: "In a territory so repeatedly desolated by savages, I cannot understand why there is not a military post and a military force at its capital."

In the early part of 1869 Colorado's "biggest guns" in the persons of prominent men who were working for the passage of the congressional act to provide a subsidy for the Denver Pacific Railroad, had joined forces in Washington in a final effort to secure this necessary legislation. Never was a body of men thrown together in a combined effort to work for the good of their home country who had been erstwhile political and factional enemies, as there was at that time in the national capital. Among them were Evans, Byers, Bradford, Bennet, Chaffee, Hunt, Chilcott, George T. Clark and Delano. About the middle of March the bill was passed that meant the completion of the railroad into Colorado, and all of this Colorado delegation celebrated in a genuine love feast that night at the famous



GOVERNORS OF COLORADO TERRITORY, 1865-75

1. Alexander Cummings. 2. A. Cameron Hunt
3. Edward McCook. 4. Samuel H. Elbert

old restaurant on Pennsylvania Avenue known as "Harvey's."

Like the explosion of a bomb came the announcement from Washington that President Grant had removed Hunt and appointed one of his former generals in the army, E. M. McCook, to succeed him as governor. This act Grant was only too glad to acknowledge as a mistake in later years. Colorado people had only begun to appreciate Hunt when he "walked the plank" as three former Colorado appointees to the governorship had done. McCook arrived in Denver June 14, 1869, and was immediately sworn in and assumed his executive duties. He was by no means a stranger, for he came to Gregory Gulch in 1859 and for a time practiced law in Central City. When the war broke out he entered the army, was promoted for bravery and finally received a major-general's commission. Later he was appointed United States commissioner at Honolulu.

For several days prior to June 22, 1870, the whistle of the locomotive could be heard in Denver from the end of the track down the Platte, and on that date the last spike was driven at the foot of what is now Twenty-second Street. Officially, the last spike was of solid silver, and though driven into the tie by Governor Evans, was removed and preserved as an interesting relic. Several thousand people witnessed the event and many awaited the coming of the first train from Cheyenne that arrived that evening with forty passengers. With the completion of the railroad and consideration of other plans for lines from Denver to other parts of the territory, Colorado seemed to have automatically entered on a new era. Men who had driven bull teams across the plains and washed gold from the gulches, those who preëmpted or homesteaded the first land claims, or who began business in log cabins, now engaged in larger undertakings. The smelting industry had passed the experimental stage, great irrigating canals were being projected from river bottoms to the uplands and improved mining and farming machinery found ready sale to miners and farmers.

Grading commenced from Denver east to meet the Kansas Pacific Railroad and thousands of pine and spruce ties were cut in Platte Cañon and floated down the river

to Denver, where booms caught them for delivery to the railroad contractors. On August 16th the gap was closed on the Kansas Pacific forty miles east of Denver, and that night at 6:45 the first train came in from Kansas City. General Palmer and H. H. Greenwood were actively associated with the construction of this road, of which it was said, "The rifle was as necessary as the pick and spade and the whole route is lined with the graves of those who fell at the hands of the Indians, who resisted to the last the advance of civilization." On August 21st Steve Harmon drove the last stage coach into Denver over the plains route via Smoky Hill.

The site of Colorado Springs was located about July 1, 1871, and work was commenced in platting and surveying. General Palmer had selected "Glen Eyrie" for a home and commenced hauling material for buildings. On July 29th Colonel Greenwood drove the first spike that began construction of the Denver & Rio Grande Railroad. This was done on Wynkoop Street, between Eighteenth and Nineteenth, a short distance east of the present Denver Union Station.

The history of Colorado legislatures during the territorial period is one of genuine service by men of high ideals and sterling honesty. There is nothing to record of anything but straightforward effort to work for the best interests of the country, and little to even criticise from any viewpoint with the exception of a deadlock at the time special legislation was demanded for the Indian war. That was occasioned by earnest men holding opposite views on a question of matters relating to statehood.

With all the demands for funds for carrying on the government, a statement published in February, 1872, showed no indebtedness and \$50,000 in the territorial treasury. No taxes were assessed for 1872, and for 1873 not over 1½ mills on the dollar was levied.

White men had entered the Indian reservation in the southwest for the purpose of prospecting for mineral in 1872, and reports of their discoveries prompted many to go into this forbidden territory, then occupied by the Utes

under treaty with the Government. About April 1st orders were sent to Federal officials in Colorado to prohibit such trespassing. Eastern journals were not slow in taking up the side of the Utes and reference was frequently made to Colorado people who were supposed to favor such efforts to discover new mines as "incurable land grabbers." The section covered by these daring prospectors was a part of what was later called "The San Juan Triangle."

McCook did not serve his full term. Dissatisfaction with his administration of territorial affairs resulted in the circulation of a petition for his removal. The President complied with the request and immediately appointed Samuel H. Elbert, son-in-law of Former Governor Evans, to fill the vacancy. Elbert's arrival on April 4, 1873, brought out a large crowd of friends and admirers whose enthusiastic welcome indicated general public approval of his selection as governor. He entered on duty April 17th, and the same day a reception was tendered to McCook by The Governor's Guard. The retiring executive was deeply humiliated and did not encourage his friends in tentative plans for a public demonstration in his favor, but to a few he expressed his determination to return to Washington and initiate action to secure reappointment through the influence of powerful army friends.

The first official duty of Elbert was the welcome extended to President Grant and his party, including Mrs. Grant and their daughter Nellie. The President and family were guests of Governor and Mrs. Evans at their home on Fourteenth Street, on the site now occupied by the Tramway Building. The writer's memory goes back to the afternoon of the arrival of the President, when a delegation of boys and girls from the West Denver school marched in a body to the Evans mansion and lined up two or three deep along the front fence, awaiting opportunity to pay their respects.

A day or so later the party went to Central City, where all lunched at the Teller House and returned to Denver by way of Idaho Springs to Floyd Hill, at that time the end of the track. That evening a reception was tendered the President in Denver, and one of the features of the evening was the presence of some forty Ute Indians, who had

begged opportunity to greet the "Great Father." An observer of the events of the evening remarked that "the Indians filed in and out with more decency and order than many of their white brethren." From Denver the party went to Cheyenne, and at every station people congregated in large numbers to offer their respects.

An event of great interest, and one that led to development of one of the greatest precious mineral areas in the Western country, if not in the world, was conclusion of a treaty in September, 1873, with the Ute Indians whereby some three and a half million acres of lands included in their reservation were opened to the prospectors and miners. The story of what followed in breaking burro trails over the ranges of lofty mountains, through gulches and cañons to the little parks where settlements were established, is one of the most thrilling in Western history. Burro trails were abandoned when Otto Mears and his associates built toll roads and established stage stations, and these were in turn made practically desolate after the Denver & Rio Grande crossed Marshall Pass and extended the southern line, then terminating at Alamosa, over the Cumbres Range to Durango.

As Gilpin County produced men who were to be nationally known and respected, so the Silvery San Juan gave to Colorado and the world men of splendid intellect and ability who, like their brethren in other northern counties, pioneered the camps of Lake City, Ouray, Telluride and Silverton.

Probably the greatest political surprise Colorado ever experienced was that occasioned in the brief announcement by wire to Denver on January 28, 1874, that Grant had sent to the Senate nominations of Former Governor McCook for governor, John W. Jenkins of Virginia as secretary, and T. B. Seawright of Pennsylvania as surveyor general of Colorado. In removal of Elbert, Hall and Lessig, no charges were mentioned against the former officials, nor was even an explanation offered. Jerome B. Chaffee was in Washington at the time and was as greatly surprised as any one. He felt the sting even more than Elbert, since his relations with the President had been of the most friendly nature, and he at once announced his

determination to fight McCook's confirmation. In this he was nearly successful, but at the end of nearly five months the Senate confirmed the nomination of McCook on June 19, 1874. He did not reach Denver until July 24th. Public sentiment might have resulted in unpleasant demonstrations against McCook at this time had not the death of his wife occurred in May. Instead, expressions of regret at his loss were frequently heard from those who had so strongly opposed him, and feeling quieted down.

About September 1st reports from the farming districts told of crops having been seriously damaged or practically destroyed by grasshoppers, and donations of food and clothing were forwarded from Denver, Pueblo and the mining centers. Still there seemed to have been enough produced in more favored spots to make a very good exhibit at the Territorial Fair, where on September 27th Schuyler Colfax addressed 3,000 persons. He stood in a farm wagon during his speech and endeared himself to the assembled people by declaring against the Federal policy with the Indians, and expressing his confidence in the resources of the country and his unwavering stand for statehood. Colfax was of that type of Eastern men who came to Colorado, studied its problems, acquired first-hand information from visiting its towns, ranches, mining camps and even remote settlements, and, impressed with promises of its future, returned to tell of his conclusions. Slowly but surely Eastern sentiment underwent a decided change in our favor.

McCook had been in office but a short time when President Grant appeared to realize that a serious mistake had been made in his appointment. The *St. Louis Republican* of February 3, 1875, carried a story of Colorado's muddle, and other papers in the East and West had much to say of the long list of territorial executives who had sprung up, flourished for a time, and all met the same fate. The opinion held by the Laramie (Wyoming) *Sentinel* was expressed as following: "We don't reckon there was ever a territory or state that required so many governors for home consumption as Colorado, and her future historian will be likely to go crazy in tracing out and recording them."

An incident in the history of the San Juan that took

place about this time may illustrate how quickly discoveries of rich mines caused a hasty change of the seat of local government. On the state highway between Del Norte and Lake City, in Antelope Park, an old stone building stands by the roadside. Up to February, 1875, this was the courthouse, post office and general office building for that undefined region, the San Juan. Word came to the sheriff, probate judge, clerk and other officials that Lake District, some forty miles to the northwest, was the center of great mining activity, and people were rushing in by hundreds. The first mine discovered, The Hotchkiss, had produced ore so rich that it was profitable to pack it over the range on burros, haul a long distance by mule teams and ship to the smelters from the terminals of railroads, and others in the vicinity promised fully as well from surface openings. Accordingly, the situation was gravely discussed by Antelope Park officers and conclusion was reached that "the capital must be moved." Forthwith, records, books, documents and furniture were loaded into freight wagons and taken over the Divide, down Slumgullion Gulch to the new camp, which later was called Lake City, where everything was duly "set up" and business resumed.

Governor John L. Routt, who was appointed to succeed McCook, was sworn in by Chief Justice Hallett on March 29, 1875, and from the first created a good impression. A new appointment to the office of city attorney of Denver was made at this time of a man who was chosen because "he is a trained lawyer and business man of irreproachable character," as a local paper put it. This man was destined to achieve a national reputation as a lawyer, and was a citizen of Colorado whose character and abilities were to be recognized in electing him governor of Colorado and later United States senator, the Hon. Charles S. Thomas, who so graphically tells in this history the political events in Colorado during the past fifty years.

Our splendid capitol with its spacious grounds is not what was contemplated in 1875. A very modest building, it was thought, would provide ample convenience for that period and for many years to come. Cost of construction was to be raised from voluntary contributions from citizens. Lots and other parcels of ground had already been donated,

to be sold later and proceeds applied to the fund. But William N. Byers took a larger view of the future than those who thought \$75,000 might be sufficient, when he said, "If in a score of years a million people are gathered within our borders, one costing a half million dollars will be little enough to meet the demands of the state."

By June the South Park Railroad had been completed to Morrison, where McClelland and Spotswood's stages connected with their line of Concord coaches for the South Park country. These stage coaches were of the best remaining after overland travel had ceased. "Bob" Spotswood was one of the pioneer stage and express men of the overland days. His greatest achievement was to come later, however, when the South Park Railroad was building toward Leadville and he handled all mail and express matter, together with the passenger traffic from the railroad terminals, with six six-horse stages each way daily. When Governor Evans and his associates commenced extending the South Park Railroad from the mouth of Bear Creek, seven miles above Denver, Buffalo Creek on the Platte, thirty-three miles away, was expected to be a terminal for some time in handling traffic to South Park and Breckenridge districts. Unconsciously, as it turned out, they were preparing for a traffic to Leadville scarcely before equaled.

On March 3, 1875, Congress passed an enabling act for the admission of Colorado to statehood. In conformity with this act, members of a constitutional convention were elected October 25th, and these delegates assembled in Denver December 20, 1875. The work of the convention was completed on March 14th following, and the document was submitted for ratification July 1, 1876. The time was ripe for statehood. In the five years immediately preceding, the population of the territory had doubled and was now near the 100,000 mark. The constitution was adopted July 1st, and, with statehood assured, a grand celebration was held at Denver on the Fourth of July, commemorating the achievement of statehood and celebrating the centennial of American independence.

The massing of thousands of people in the vicinity of the American House, on Blake Street, the starting of a

great procession headed by bands of music, the wonderful floats and waving banners in the long line of happy and enthusiastic people on their way to Denver Park, on the west side of the Platte River, north of present Colfax Viaduct, were striking features of the day. The river was then a beautiful stream flowing over a wide bed of gravel, flanked on the east by an expanse of natural meadows dotted with thickets of wild plum, cherry, mountain birch and boxelder. All over the grove tables and benches had been made of rough lumber, and about the center a speakers' stand had been raised several feet above the ground. A multitude sat at tables or scattered in groups along the river banks, and feasted on wagon loads of good things until all were satisfied. Here and there crowds gathered around old pioneers who told of emigrant trains, Indians, digging gold, of floods and grasshoppers, first irrigating ditches, miners' courts and vigilance committees, while happy boys and girls waded in the shallow places of the river or sported in scores of swings hanging from cottonwood limbs. Erstwhile political or factional enemies met, smiled and shook hands as memory of old fights faded away, for the common dream of all had at last come true.

A great mass crowded around the speakers' stand when announcement was made that the ceremonies were to begin. Rev. E. T. Bliss offered thanks to God for the new commonwealth. Professor Goldrick read an historical sketch, Greenleaf read his centennial poem, and Reverend Ellis delivered the oration. Governor Routt announced the receipt of a telegram. To this day we remember just how he took ample time to adjust his glasses and said, "I have just had word from our representative at the centennial exhibition, Stephen Decatur. Steve wants to know if we are a state, and here is what I have just replied, 'We are. The Centennial State and twenty thousand people here assembled send joyful greetings to the sister states of the American Union, represented at Philadelphia on this very glorious Fourth.'" And the said 20,000 people responded by cheers that might have been heard for miles. In point of evidence of civic pride, spontaneous enthusiasm and good

will to one another, that gathering has never been equaled in Colorado.

On August 1, 1876, President Grant issued the formal proclamation admitting Colorado to the Union. We may believe that few of his official acts gave him more satisfaction, for from his early visits he had from close contact with the people known of their long-deferred hope for statehood, and though by reason of not being fully advised of the territorial political tangles, he made what he later acknowledged as mistakes, his sincere interest in our welfare was never doubted by those who knew him best. We have recorded the proceedings of solemn councils on the banks of Cherry Creek when local government was first discussed and a state suggested. We remember that in later years it was a debated question and honest men differed as to practicability of a state at the time. We remember disappointed hopes when first appeals to Congress were denied and the veto of a President deferred statehood. But on this summer day beside the river these pioneers who had traveled from the "Big Muddy" to the mountains forgot all disappointment, in universal joy of final victory.

CHAPTER X

MINING IN COLORADO

Charles W. Henderson

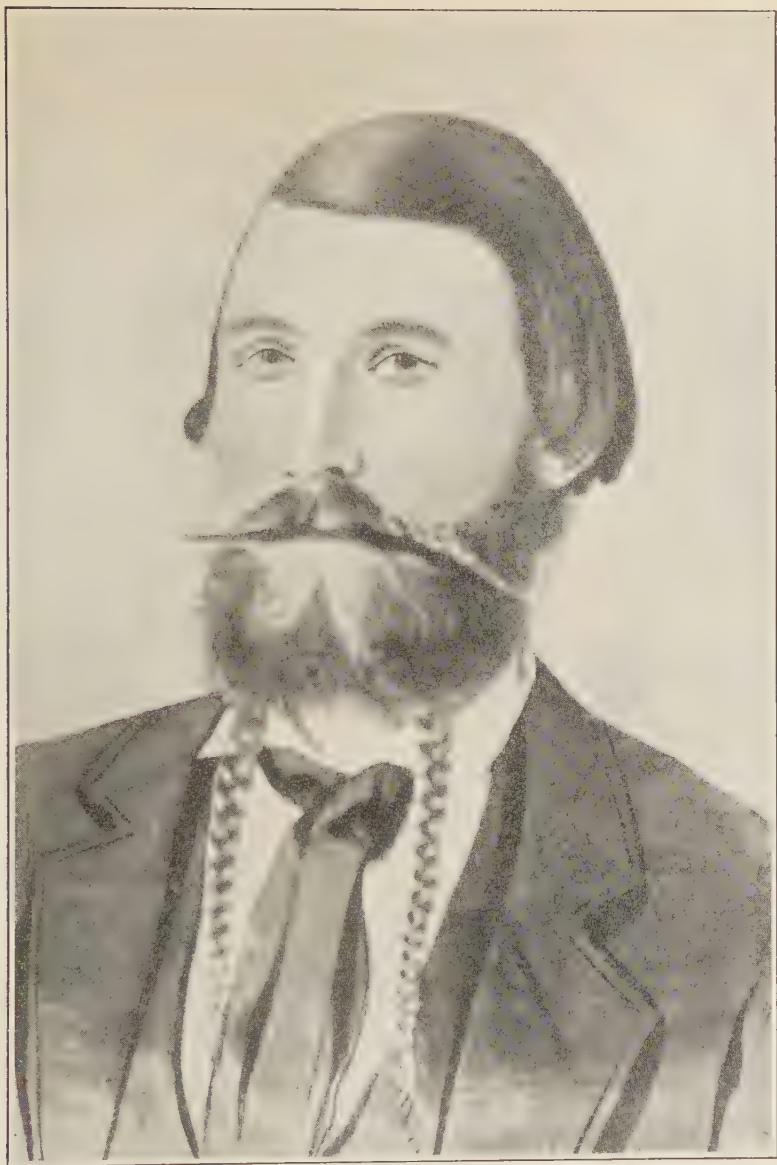
EARLY REPORTS OF GOLD DISCOVERIES—THE RUSSELL PARTY, 1858—THE PIKE'S PEAK RUSH—JACKSON AND GREGORY DISCOVERIES—SPREAD OF THE DISCOVERIES—MINING IN THE EARLY SIXTIES—SILVER DISCOVERIES—ORE PRODUCTION IN THE SEVENTIES—THE SAN JUAN REGION—LEADVILLE—CREEDE AND CRIPPLE CREEK—DROP IN SILVER AND THE PANIC OF 1893—RECENT PRODUCTION—ZINC—COAL — PETROLEUM — FLUORSPAR—OIL SHALE—RADIUM, URANIUM, AND VANADIUM—IRON AND IRON-MANGANESE—MOLYBDENUM, TUNGSTEN, AND BISMUTH.

GOLD, SILVER, COPPER, LEAD, AND ZINC

Up to 1858, the mountains and plains of the region now embraced by the State of Colorado were not untrodden by the feet of men. Indians, Spaniards, French, Americans, Mexicans, fur hunters, adventurers, and United States soldiers and special expeditionary forces had made it far from an untracked region. Pursley is said to have reported to Pike at Santa Fé in 1807 the existence of gold in the South Park. By 1842 gold was known and mined on the Sweetwater River (now Wyoming), on the Oregon Trail. The Cherokee Indians (of Oklahoma) are said to have brought specimen gold from the headwaters of the South Platte to the residents of the Missouri River from 1849 to 1857. The overland Argonauts of 1849, in their rush to California, were too intent on reaching the bonanzas at the end of the long trek and on making all possible speed by way of the Santa Fé Trail south of Colorado, or by the Overland Trail north of Colorado, and even occasionally

by trails joining the Santa Fé and the Overland trails east of the Rocky Mountains, to stop and search for gold or to attempt to cross the high Colorado mountain passes.

It remained for an organized party of experienced Georgia placer miners from Dahlonega and Auraria, further trained in the California gold fields, and supplemented by guides from the Cherokee Nation, with voluntary recruits of men from Missouri, Arkansas, and Kansas, to bring the first permanent settlement to Colorado. This expedition of 104 men in early 1858 came up the Arkansas River and turned north up Black Squirrel Gulch, east of Pueblo, and after crossing the low divide found in Cherry Creek and its gulches small but disappointing concentrations of flour gold, derived from ancient delta flows of the scouring rivers which preceded the south and north forks of the South Platte. Another party from Lawrence, Kansas, started up the Arkansas several weeks behind the Georgia party in this search for gold in what was then known as Western Kansas. The Georgia party reached camp at the mouth of Cherry Creek on May 23, 1858, and searched up and down the Platte River, but found nothing of value, so crossed the Platte and prospected the younger gravels of Clear Creek to Ralston Creek, but the search resulted in disappointing discoveries of gold. They prospected up Ralston Creek and Clear Creek, and back into the mountains for about five miles and found gold with nearly every pan, but in very small quantities. Thereupon, about June 10, all the Cherokee group left the expedition. About fifty men remained. These prospected as far north as Boulder Creek and Big Thompson Creek and south to Bear Creek and into the mountains a short distance. Finding nothing of importance, the party decided to recross the Platte and went into camp again on Cherry Creek on June 24. At this time all but seven of the original Georgia party and all but six of those who had joined in Kansas turned homeward, with tales of failure. The returning Cherokee Indians and whites met the Lawrence party, and that expedition turned south and prospected the region near Raton Pass, New Mexico, but later that year turned north toward Pikes Peak and prospected there without success. There remained, in the vicinity of what is now Denver,



WILLIAM GREEN RUSSELL, PIONEER PROSPECTOR

thirteen of the Georgia party, including the leaders, the Russell brothers (William Green Russell, James Oliver Russell, and Dr. Levi John Russell). These men started up the South Platte and found gold in Big and Little Dry creeks from their headwaters to their junction with the South Platte, near what is now Englewood and Petersburg. But the finds were disappointing. A chance traveler, Cantrell, carried back to Westport, now Kansas City, Kansas, some of the gravel from Dry Creek and panned it in view of witnesses. The Russell party went in August as far north as the Cache La Poudre, but found only light fine colors of gold, and snow fell September 22, so in ten days they were back in camp on Cherry Creek, where they found the Lawrence party in camp. William Green Russell and J. O. Russell went back to Georgia to get friends to come out with them. Dr. Levi John Russell and others went to Fort Garland for provisions, and others stayed and built cabins for the winter near the Platte, 100 yards south of the mouth of Cherry Creek. About the time the men got back from Fort Garland, men began to come in from the Missouri River, and by Christmas there were about 200 men on the Platte.

The financial panic of 1857 had carried well into 1858 and 1859, and the rumors of the gold discoveries of the Pikes Peak region were too strong to combat the stories of the returning disappointed prospectors. In the fall of 1858 and in the spring of 1859 there was literally a rush to Cherry Creek. Placering in 1859 was done on the Platte above Denver, and along Clear Creek, to Golden. Arapahoe City was built three or four miles east of the gap between North and South Table mountains, and Golden was built where Clear Creek emerges from its narrow mountain gorge onto the plains. George A. Jackson, a Missourian, followed Clear Creek (then called the Vasquez) to its junction with what is now Chicago Creek (near what is now Idaho Springs), in December, 1858, and January, 1859, and found placer gold on January 7, 1859. He was forced by a severe snowstorm to return to Golden, and with friends returned on April 1, to find gold in quantity, and to allow his friends from Chicago to name the creek. The place was called Jackson Diggings. John Hamilton Gregory, a

Georgian, went up Clear Creek to the forks of South and North Clear Creek, turned up the north fork and found the outcrops of veins in surface residual deposits of gold just above the present town of Black Hawk, on May 6, 1859. This locality was named Gregory Diggings. Langley is said to have found placer gold below Rollinsville (near Pactolus), on Beaver Creek (called Deadwood Diggings), in January, 1859, and Clouser is said to have found placer gold on Four Mile Creek (Boulder County) either late in 1858 or early in 1859. William Green Russell, in the first days of June, 1859, discovered placer gold in Russell Gulch. The rush to the Pikes Peak region continued in greater numbers.

Hardly any of these men, except the Georgians and those who came from California, knew anything of minerals or mining. Yet in 1859 they discovered gold in Gregory, Illinois, Central, Eureka, Lake, and Russell gulches, of North Clear Creek; Chicago Creek, South Clear Creek from Fall River to Floyd Hill, Mill Gulch, East Fork of South Clear Creek; Four Mile Creek, Beaver Creek, South Boulder Creek, Tarryall Creek, South Fork of the South Platte from Montgomery to Fairplay, Georgia Gulch, Chalk Creek, Cache Creek, Lake Creek, and California Gulch. In 1860 placer gold was discovered in McNulty Gulch, on Ten Mile Creek. As early as 1861 they discovered gold on Taylor River, in what has since been known as the Tin Cup district, and almost simultaneously the deposits in Washington Gulch, in the northern part of Gunnison County. However, this region was far away across some of the most stormy passes of the Sawatch Range, and little work was done there. Nevertheless, by 1867, placer gold had been discovered in the region now covered by Gunnison County, in Kent, Union, Illinois, Texas, Willow and Washington creeks. In 1865 placer gold was found at Hahns Peak.

The activity at Gregory Diggings was intense. By July 1, 1859, 100 sluices were running within a short distance of Gregory Point. By the middle of July a Spanish arrastre was grinding quartz near the mouth of Gregory Gulch. On September 17, 1859, the first steam quartz mill (a one-stamp mill operated by steam) was erected and was

soon in successful operation. By October 1, 1859, five arrastres and two small wooden stamp mills were running on North Clear Creek, all driven by water, and four arrastres were being built.

A second rush to the Pikes Peak region was made in 1860. Most of the immigrants were headed for Gregory Diggings, which they found overcrowded. Some obtained work of some description, and others (with even earlier arrivals) spread in every direction. The quantity of water for sluicing in Russell Gulch and other gulches of North Clear Creek was found to be too small for the demands of the miners and the Consolidated Ditch was completed on July 4, 1860, bringing water from Fall River. A big rush was made this year into California Gulch (now Lake County). Lode and placer mining was active at Empire, Mill City, and Idaho [Springs]. The need of the citizens for coin was supplied by the establishment in Denver of a banking, coining, and assay office by Clark, Gruber & Company. Gold in lodes was discovered at the Phillips mine, Buckskin Gulch (now Park County). This year, Lieut. John Baker led an expedition up the Rio Grande and down the Animas to Baker's Park (now Silverton), but he was overtaken by the heavy winter snows and harassed by the Ute Indians, and many of his party perished miserably, a remnant only escaping over the mountains after suffering great hardships.

Because of the Civil War there was only a slight immigration in 1861, but Congress had organized the Territory of Colorado on February 26, and the first Territorial Legislature met September 9, and created seventeen counties, fixed the county seats, and upheld the mining laws of the local mining districts, nearly all of which had used the general pattern outlined and adopted at Gregory Diggings June 8, 1859. There was a great deal of experimentation in 1861 in Gregory and other districts of Gilpin and Clear Creek counties in the treatment of ores by various forms of crushers, by steam, by fire, and by chemicals. Stamp amalgamating mills were built in the various districts. At Idaho Springs a twenty-stamp mill was treating the ores of the Whale, Lincoln, and other lodes.

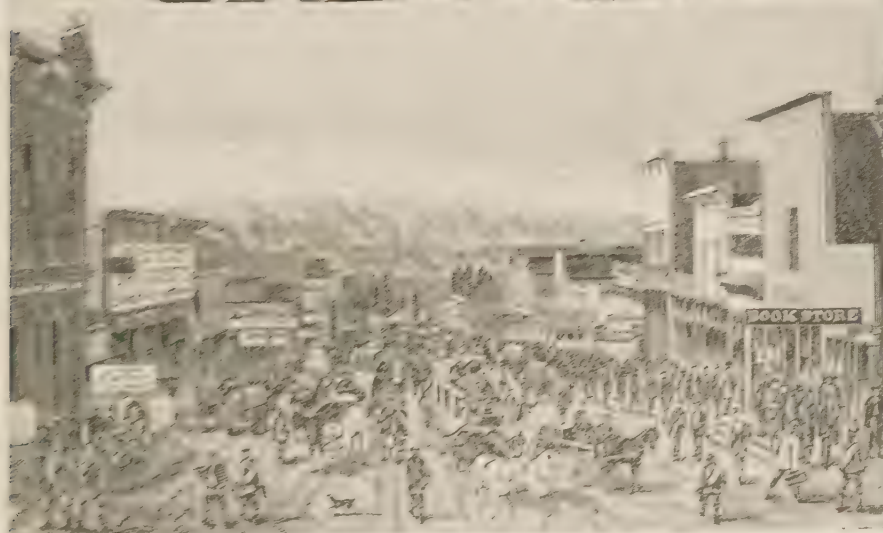
There was only a slight immigration in 1862-63. Some

of the miners went home to join either the North or the South. The Georgia members of the Russell party tried to return to the South, but were made political prisoners. Two Union regiments were formed. The mills of the Gregory district found great difficulty in recovering the gold from the ores below the oxidized zone. The losses of gold were perhaps as high as 75 per cent. In the Lamar-tine Trail Creek district, Clear Creek County, the Freeland mine was discovered in 1861 and yielded handsomely to 1888.

In 1863 there were many sales of mines in Gregory district to Eastern investors and much speculation in New York and Boston in the shares of these mines.

In 1864 a forty-stamp mill and a reverberatory furnace for gold ores were built at Georgetown. Mining at Gregory was nearly at a standstill and the same condition prevailed in 1865-66. Early in 1864 the discovery and identification of silver ore on the Coaley claim, on Glacier Mountain, near what is now Montezuma, drew attention to the headwater of South Clear Creek, and in September the Belmont lode, on Mount McClellan, eight miles above Georgetown, was discovered. This mine became a profitable one, and is often credited as the first paying silver mine in the state. In the same year, at Black Hawk, the Coaley silver mine was discovered. In 1865 there was a rush to the Argentine district, at the head of South Clear Creek, and in 1866 Georgetown and Elizabethtown (later joined to form Georgetown) were in their making. In 1866-67 the gold ores of the Griffith district (Georgetown) and the silver ores of the Argentine district drew many people to Georgetown.

The year 1867 was an eventful year. The Hill, or Boston & Colorado Smelting Company's, experimental plant was erected at Black Hawk in June, and hope rose in the hearts of the miners. The Union Pacific Railroad was completed from Omaha to Cheyenne. But the rich placer mines of California Gulch were about exhausted and the easily worked gold placers and surface gold deposits of the South Park mines were about gone. The placer mines at Breckenridge were still working successfully. From 1858 to the end of 1867, Colorado Territory had produced \$25,021,784



EARLY MINING SCENES (Contemporary Drawings)
Upper, Gregory Creek, Idaho. Lower, Leadville, 1880

in gold, divided as follows: From the area now included in Gilpin County, \$9,434,784; in Lake and Chaffee counties, \$5,652,000 (with perhaps \$3,000,000 of this from the California Gulch placers, and the remainder from others, chief of which was the Cache Creek placers, Chaffee County); in Summit County, \$5,150,000; in Clear Creek County, \$2,100,000; and in Boulder County, \$195,000. To the end of 1867, Gilpin County had produced 234,880 ounces of silver, Lake County 37,600 ounces, and Clear Creek County 30,349 ounces, with a total for the state of 302,829 ounces, with a value of \$406,139. The production of gold and silver combined from Colorado Territory from 1858 to 1867, inclusive, was valued therefore at \$25,427,923.

The year 1868 was a notable year. The principal producing mining camps were in Gilpin County, but the Dives and Pelican silver lodes were discovered, at Silver Plume, and gold was discovered at Ward, and some mining of gold lodes was done in California Gulch. The chief event of the year was the opening for business, in January, at Black Hawk, of the Hill reverberatory copper matte smelter. The first shipment of matte was made in June. This smelter bought ores from Park, Boulder, Clear Creek, and Gilpin counties, and revived the waning mining industry of Colorado.

In 1869 silver ore was found at Caribou, Boulder County.

On June 24, 1870, the Denver Pacific Railroad (now Union Pacific) was completed from Denver to Cheyenne, Wyoming, and in August the Kansas Pacific Railroad (now Union Pacific from Kansas City) reached Denver by the Smoky Hill route. The Colorado Central Railroad between Denver and Golden was completed in September, 1870. Gold was discovered in Wrightman's Gulch, Summitville district, Rio Grande County, and also in Arrastra Gulch, near Baker's Park. In the year 1870 Clear Creek County's silver production began to indicate the possibilities of the enormous silver resources, which gave in 1873 a production of over 1,000,000 ounces, rising to 1,500,000 in 1874, and continuing at that average rate each year until 1901.

In 1871 Colorado Territory produced gold, silver, copper, and lead, valued at \$4,740,000, from Boulder, Chaffee,

Clear Creek, Gilpin, Lake, Park, and Summit counties, of which Gilpin and Clear Creek counties combined produced \$4,262,011, and Gilpin County alone \$3,359,240. In that year silver deposits were discovered on Lincoln and on Bross mountains, Park County. In 1871 the Denver & Rio Grande Railroad was built south from Denver to Colorado Springs.

In 1872 the silver mines of Custer County began to produce, and in 1873 the mines of Rio Grande, Routt, and San Juan counties. In 1872 the Colorado Central Railroad was extended from Golden to Black Hawk and from Forks to Floyd Hill. In 1872 the Golden City Smelting Works (a lead blast furnace) was built at Golden, and a lead blast furnace was built at Dudley, Park County, another blast furnace at Montezuma, and a small Mexican furnace at Rico. That year petzite (a telluride of silver and gold) was discovered at Gold Hill, Boulder County.

In 1873 a branch smelter of the Boston & Colorado Smelting Works (Hill Smelter) was built at Alma. It was operated only through 1875.

In 1874 Clear Creek County produced a total of \$2,182,846, Gilpin County \$1,634,274, Park County \$533,142, and Boulder County \$521,177, out of a total of \$4,200,704 for Colorado Territory.

In 1874 there was a rush into the San Juan country. The Hotchkiss (Golden Fleece) mine, near Lake City, was discovered. Gold was also discovered at Sunshine, Boulder County, and silver at the Humboldt-Pocahontas mine, at Rosita, Custer County. The South Park Railroad was built from Denver to Morrison. Two unsuccessful smelters were built at Silverton.

In 1875 there were many new discoveries, such as the Grand View claim, Ouray County; deposits at Salina, Magnolia, and Jamestown, Boulder County; the Mary Murphy, on Chalk Creek, Chaffee County; and the Smuggler deposit, above Telluride, San Miguel County; but Boulder, Clear Creek, Gilpin, Park, Rio Grande, and San Juan counties were the principal producing counties, with Gilpin and Clear Creek counties predominantly the most active. Lake City was founded and the Crooke smelter built there. A lead smelter was built at the mouth of California Gulch in

the hopes of obtaining other silver ores similar to that already found at Homestake Peak. The Mary Murphy mine, on Chalk Creek, Chaffee County, was being opened. The Greene smelter was built at Silverton. The Collom lead plant was built at Golden. In 1876 the Virginia Canyon mines, between Russell Gulch and Idaho Springs, were brought to notice by the opening of the Specie Payment mine. The South Park Railroad was being pushed up the north fork of the South Platte from Denver, with the San Juan country in view as its final destination. The Denver & Rio Grande Railroad by 1876 had been built to Pueblo, Canon City, and La Veta. That year the discovery was made that the heavy sands in the sluice boxes, which had for years bothered the placer miners in California Gulch, were rich lead carbonates.

The year 1877 saw a great rush to Leadville and a quickening of development throughout the entire state. That year the Una and Gertrude claims, forerunners of the great Camp Bird mine, Ouray County, were staked. [The Camp Bird mine produced \$27,269,768 from 1896 to 1916.] That year the Colorado Central reached Georgetown. The Bassick gold deposit, at Querida, Custer County, was discovered. The Leadville smelter was built at Leadville. That year Clear Creek County produced \$2,063,822; Gilpin, \$2,259,078; Boulder, \$678,437; and Lake County (Leadville), \$670,600.

In 1878 Leadville astonished the state by producing \$2,490,000, while Gilpin County produced \$2,318,635, and Clear Creek \$2,259,750. That year the Great Monarch claim and the Madonna deposit were discovered at Monarch, Chaffee County. Silver was discovered at Robinson and Kokomo, in the Tenmile district, and the Bull Domingo and other mines near Silver Cliff were opened. That year the Hill copper smelter was moved from Black Hawk to Argo Junction, near Denver, where it continued in operation until 1910. The Denver & Rio Grande Railroad had reached Alamosa in 1878.

The Denver & Rio Grande Railroad determined to build to Leadville. Its narrow gauge line reached Leadville in 1880, and also that year reached Espanola and Chama, New

Mexico. It reached Durango and Gunnison in 1881, and Silverton, Sapinero, Montrose, and Grand Junction in 1882.

But 1879 was also a glorious year of discoveries: the Belden lode, near Red Cliff, Eagle County; Bonanza, Saguache County; gold in the Independence district, and silver at Aspen, Pitkin County; the Terrible mine, at Ilse, Custer County; the rapid development at Robinson and Kokomo; and the opening of mines at Rico, Dolores County.

In 1880 there were at Leadville eleven or twelve operating lead smelters, several ore buying firms, and four stamp mills. The Greene smelter was active at Silverton, and the Crooke smelter at Lake City. There were three smelters operating at Golden. The Grand View smelter was built at Rico. There were five small smelters at Garfield, Maysville, Poncha Springs, and on Chalk Creek, Chaffee County. Two smelters were built at Tin Cup and one at Gothic. In 1880 the production of the state was \$23,560,910, of which Leadville produced \$14,910,860; Gilpin, \$2,716,036; Clear Creek, \$2,452,729; Boulder, \$789,200; Custer, \$864,929; and Summit County, \$438,675. That year the gold lodes of French Gulch, near Breckenridge, were discovered.

From 1880 to 1891 was merely a procession of development and discovery. In 1881 the Greene smelter was moved from Silverton to Durango. The deposits at Red Mountain and Ironton, Ouray County, were discovered. The Kokomo-Robinson district helped push Summit County's production up to 1,560,000 ounces of gold and 16,773,000 pounds of lead.

In 1882 the present Durango smelter was opened; the Grant smelter was built at Denver; the Pueblo lead plant was built at Pueblo, by Mather & Grist; a lead smelter was built at Aspen [it ran until 1887].

Production for the state from 1881 to 1891 was as follows:

*Gross Production of Gold, Silver, Copper, and Lead in
Colorado, 1881-1891.*

1881	\$22,350,972
1882	23,583,713
1883	25,270,507
1884	22,972,166
1885	21,568,983



UPPER: CENTRAL CITY (about 1872); LOWER: GEORGETOWN

1886	22,260,907
1887	21,320,794
1888	23,508,517
1889	26,553,104
1890	29,380,639
1891	31,803,531

And in 1891 the silver mines at Creede, the gold mines at Cripple Creek, and the gold mines of Breece Hill (Leadville) were discovered.

In the meantime, the Denver, South Park & Pacific Railroad had in 1883 reached Leadville by way of Como, Breckenridge, and Tenmile Creek; the Eilers lead plant was built at Pueblo in 1883; the Globe lead plant was built near Denver, by Holden and Chanute, in 1886; the Yak tunnel was started at Leadville in 1886; the Denver & Rio Grande had reached Aspen in 1887, and the Colorado Midland reached Aspen in 1888. In 1888, the Philadelphia lead smelter was built at Pueblo. In 1891, Bartlett erected a zinc oxide plant at Canon City, based on his experiments from 1885, to save the zinc in Colorado ores.

For the year 1892, the total production of Colorado metals was \$31,912,617. In 1893, the price of silver dropped to 78 cents an ounce, having been \$1.05 in 1890, 99 cents in 1891, and 87 cents in 1892. And in 1894, silver averaged 63 cents; in 1895, 65 cents; in 1896, 68 cents; in 1897, 60 cents; in 1898, 59 cents; in 1899, 60 cents; in 1900, 62 cents; in 1901, 60 cents; in 1902, 53 cents; in 1903, 54 cents; in 1904, 58 cents; in 1905, 61 cents; in 1906, 68 cents; and in 1907, 66 cents.

But in 1893, with Summit County producing \$693,838, San Juan \$933,436, San Miguel \$1,457,583, Gilpin \$1,463,389, Ouray \$1,502,155, Teller \$2,025,518, Clear Creek \$2,630,841, Mineral \$4,150,946, Pitkin \$4,486,043, Lake \$8,114,270, and several other counties producing from \$100,000 to \$700,000, the total for the state was \$32,648,256. In 1894 the total was \$28,167,487. In 1895, the total was \$32,231,735. In 1896, the total was \$33,649,603. In 1897, \$36,462,983; in 1898, \$43,238,272; in 1899, \$48,503,143; and in 1900, the peak of all years, \$50,614,424. In 1900, Teller County made its record production, \$18,149,645 in gold. That year, the gold production of the state reached

1895	13,305,100	.65	15,209,024	107	650,479	.032	3,006,976	.036	60,156	32,231,735
1896	14,911,000	.68	15,349,642	108	650,395	.03	2,688,178	.039	50,388	33,649,603
1897	19,579,433	.60	12,766,919	112	1,097,995	.036	2,908,592	.041	110,044	36,462,983
1898	23,534,532	.59	13,866,532	124	1,347,965	.038	4,309,813	.046	179,430	43,238,272
1899	26,508,675	.60	13,868,811	171	1,258,041	.045	6,212,178	.058	655,438	48,503,143
1900	27,762,036	.62	12,608,637	166	1,299,251	.044	7,228,090	.044	716,410	50,614,424
1901	27,679,443	.60	11,095,538	167	1,314,712	.043	6,368,772	.041	1,100,593	47,559,058
1902	28,516,914	.53	8,449,008	122	1,132,601	.041	4,358,169	.048	2,523,963	44,980,655
1903	21,605,357	.54	7,152,536	137	1,069,958	.042	4,263,566	.054	4,353,263	38,444,680
1904	24,242,485	.58	7,517,260	128	1,204,828	.043	4,622,453	.051	3,405,353	40,992,379
1905	25,295,222	.61	7,527,056	156	1,507,201	.047	5,440,098	.059	4,930,123	44,699,700
1906	22,905,671	.68	8,390,553	193	1,277,338	.057	6,078,850	.061	5,246,787	43,899,199
1907	20,307,648	.66	7,655,679	20	1,765,251	.053	4,720,457	.059	5,017,865	39,466,900
1908	22,595,571	.53	4,771,227	132	1,346,547	.042	2,589,118	.047	1,416,110	32,718,573
1909	21,984,008	.52	4,630,444	13	1,419,105	.043	3,102,980	.054	2,765,354	33,901,891
1910	20,505,614	.54	4,594,829	127	1,061,632	.044	3,346,586	.054	4,162,841	33,671,502
1911	19,001,975	.53	3,884,989	125	1,003,061	.045	3,135,568	.057	5,392,625	32,418,218
1912	18,588,562	.615	5,050,423	165	1,172,705	.045	3,385,902	.069	9,123,374	37,320,966
1913	18,146,916	.604	5,632,454	155	1,120,313	.044	3,867,502	.056	6,683,400	35,450,585
1914	19,883,105	.553	4,864,224	133	883,010	.039	2,894,264	.051	4,935,523	33,460,126
1915	22,414,944	.507	3,563,182	175	1,244,694	.047	3,234,098	.124	12,969,779	43,426,697
1916	19,153,821	.658	5,038,006	246	2,121,524	.069	4,893,072	.134	17,994,252	49,200,675
1917	15,729,224	.824	6,018,787	273	2,217,307	.086	5,847,141	.102	12,272,209	42,084,668
1918	12,751,718	1.00	7,063,554	247	1,550,501	.071	4,683,214	.091	8,111,185	34,160,172
1919	9,886,627	1.12	6,448,971	186	662,198	.053	1,964,722	.073	2,717,096	21,679,614
1920	7,576,319	1.09	5,896,175	184	744,047	.08	3,730,383	.081	3,952,050	21,898,974
1921	6,835,328	1.00	5,631,657	129	535,794	.045	884,721	.05	118,000	14,005,500
1922	6,373,419	1.00	5,855,911	135	455,416	.035	1,291,246	.057	1,325,706	15,301,698
1923	6,591,629	.82	4,374,280	147	624,472	.070	3,198,873	.068	3,682,336	18,471,590
1924	8,593,116	.67	2,180,428	131	355,432	.08	3,804,565	.065	3,687,255	18,620,796
1925	7,205,440	.694	3,022,200	142	352,500	.087	5,707,800	.076	4,636,000	20,923,940
1858 to 1925	\$688,860,446		\$506,936,573		\$ 41,035,498		\$199,174,544		\$134,539,658	\$1,570,546,719

PRODUCTION OF GOLD, SILVER, COPPER, LEAD AND ZINC IN
COLORADO BY COUNTIES, 1858-1925

	1922-1925	Gold \$	Silver \$	Copper \$	Lead \$	Zinc	Total Value \$
Adams	-----	3,403	20				3,423
Arapahoe	-----	8,147	64				8,211
Archuleta	-----	1,489	302				1,791
Baca	-----	292	226	4,441			4,959
Boulder	-----	16,029,749	7,609,252	149,074	359,631		24,147,706
Chaffee	-----	7,410,167	4,240,861	1,728,315	5,762,370	\$ 2,491,027	21,632,740
Clear Creek	-----	22,654,874	25,548,946	1,936,866	8,184,505	2,268,569	87,593,760
Conejos	-----	38,445	33,278	797	149		72,669
Costilla	-----	43,468	1,592	239	1,802		47,101
Custer	-----	2,189,573	4,565,461	106,927	1,875,740	14,787	8,752,488
Delta	-----	4,273	176				4,449
Delors	-----	1,982,431	9,226,793	1,155,771	1,772,524	770,567	14,908,086
Douglas	-----	4,606	128				4,734
Eagle	-----	3,054,009	6,739,288	1,097,378	4,721,238	17,024,753	32,636,666
El Paso	-----			2,000			2,000
Fremont	-----	81,138	85,448	120,457	28,854	105,693	421,590
Garfield	-----	16,924	337	153	1,210		18,624
Gilpin	-----	84,238,800	8,563,394	4,168,689	1,583,778	28,572	98,583,233
Grand	-----	13,183	3,001	805	178		17,167
Gunnison	-----	2,254,358	4,977,310	206,644	2,345,660	2,071,633	11,855,605
Hinsdale	-----	1,458,488	4,640,883	439,784	4,054,530	57,928	10,651,613
Huerfano	-----	3,474	698	11	38		4,221
Jefferson	-----	62,296	4,631	3,347	398		70,672
Lake	-----	52,605,494	190,361,939	14,366,829	87,528,376	86,577,693	431,440,331
La Plata	-----	3,638,244	1,154,386	45,087	12,185		4,849,802

Larimer & Jackson	1895-1925	24,304	1,735	38,647	1,659	66,345
Las Animas	1887-1925	2,094	15			2,109
Mesa	1885-1925	5,040	2,970	5,222		13,233
Mineral	1891-1925	2,725,360	29,863,048	44,187		42,963,991
Montrose	1880-1925	48,133	137,342	93,899	1,518,005	279,377
Moffat	1924-1925	97				97
Ouray	1878-1925	35,192,406	32,385,333	3,314,873	115,626	78,196,920
Park	1859-1925	10,622,677	6,929,532	393,170	196,812	19,988,200
Pitkin	1880-1925	578,137	73,594,998	197,443	1,158,007	101,691,428
Pueblo	1894-1925	793	55	35		883
Rio Grande	1870-1925	2,371,811	170,680	19,858		2,564,943
Routt & Moffat	1866-1925	388,865	19,696	16,704		430,470
Saguache	1880-1925	268,251	1,671,520	247,940	190,963	3,071,194
San Juan	1873-1925	23,428,719	21,437,710	8,133,278	6,931,319	78,443,832
San Miguel	1875-1925	62,463,388	32,966,243	2,842,380	1,341,857	110,029,185
Summit	1859-1925	19,518,627	11,807,993	154,165	11,674,188	50,456,931
Teller	1891-1925	333,415,634	1,188,248	83		334,604,014
Miscellaneous	1888-1925	8,785	1,141			9,926
Total		\$688,860,446	\$506,936,573	\$ 41,035,498	\$134,539,658	\$1,570,546,719

the peak of \$28,762,036. In 1900, the production of silver was still 20,336,512 ounces as compared with the peak for silver of 25,838,600 ounces in 1893. In 1900, lead production reached its peak of 164,274,762 pounds. In 1898, copper reached a peak with 10,870,701 pounds, to be slightly exceeded in 1909, with 10,916,191 pounds. From the peak of 1900, gold production averaged \$25,000,000 to 1905, \$22,500,000 from 1905 to 1910, and \$20,000,000 from 1910 to 1915; then continued dropping to \$6,000,000 in 1922, when a slight recovery was made for 1923; increased to \$8,593,116 in 1924; and dropped again to \$7,205,000 in 1925.

From 1900, silver dropped to 5,409,000 ounces in 1920, rose slightly in 1921 and 1922, and dropped again in 1923 and 1924, and made a slight increase for 1925. From the peak of 164,275,000 pounds in 1900, lead production dropped to 101,513,414 pounds in 1903, jumped back to 115,746,777 pounds in 1905; then down to 61,645,671 pounds in 1908, back to 76,058,775 pounds in 1910; first rose and then fell to 68,810,597 pounds in 1915; rose to 70,914,587 pounds in 1916; then plunged to 19,660,466 pounds in 1921; and back to 45,698,185 pounds in 1923; rose to 47,557,061 in 1924; and rose again to 63,000,000 pounds in 1925.

Zinc was an unwelcome constituent in Colorado ores from the earliest days, and it was not until 1891 that the first commercial purchases were made of ore for its zinc content.

In 1895, the invention of the Wilfley table, by A. R. Wilfley, at Kokomo, Summit County, gave Colorado and the world a greatly improved instrument not only for the concentration of low-grade sulphide ores, but also for the separation of the different sulphides, a separation not fully complete but sufficiently complete to allow the casting aside of much of the then despised and cursed sphalerite. In 1898 American gas retort plants of Kansas tried out (at that time with discouraging results) the ferruginous zinc sulphide ores and concentrates of Colorado, and in 1899 an enterprising broker at Leadville shipped to Belgium zinc concentrates and tailings separated from the galena and fortunately in a few instances, preserved in stock piles. The high price that prevailed for zinc in Joplin in 1899 led the zinc smelters to look for cheaper ores elsewhere, and

considerable quantities were received from Colorado. In 1901 it was estimated that 70 per cent of the Colorado zinc output was contained in zinc concentrates shipped to Europe. In 1902, magnetic separating mills were built at Canon City and Denver, and United States smelters purchased increasingly large quantities of zinc ore and concentrates but the European market continued to receive Colorado ores well into 1903. As a result of these developments, the zinc production of Colorado rose from 3,900,000 pounds in 1898 to 80,616,000 pounds in 1903, wavered a little in 1904, reached 86,000,000 pounds in 1906, stayed at 85,000,000 pounds in 1907, dropped in 1908, but picked up in 1909. With the discovery of zinc carbonate at Leadville in 1910, sulphide and carbonate ores pushed the production to 134,000,000 pounds in 1916, held up well in 1917 and 1918, but dropped sharply to 1920, with the ending supply of zinc carbonate. The turn upwards of the curve for zinc in 1922, 1923, 1924, and 1925 was brought about by flotation of sulphide ores.

COAL

The pioneers of Colorado very soon discovered outcrops of coal. The first recorded production was that of 500 tons in 1864, at Golden, where coal mining continued until 1902. The advent of railroads in 1870 was responsible for the increase to 68,540 tons for 1872. In 1880 the production was 462,747 tons, and in 1882 it had risen to 1,061,479 tons. In 1890, it was 3,077,003 tons; in 1900, 5,244,364 tons; in 1910, 11,973,976 tons; in 1920, 12,278,225 tons, and in 1925, 10,410,000 tons.

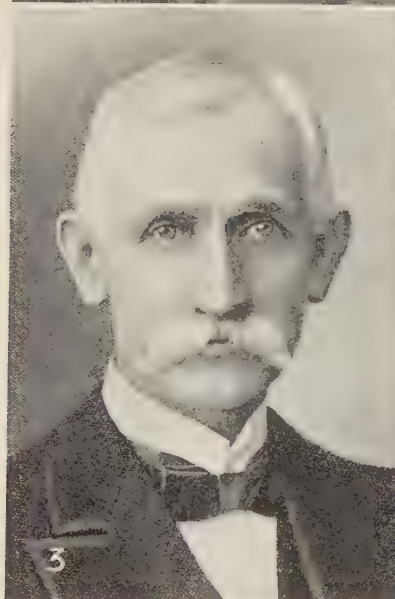
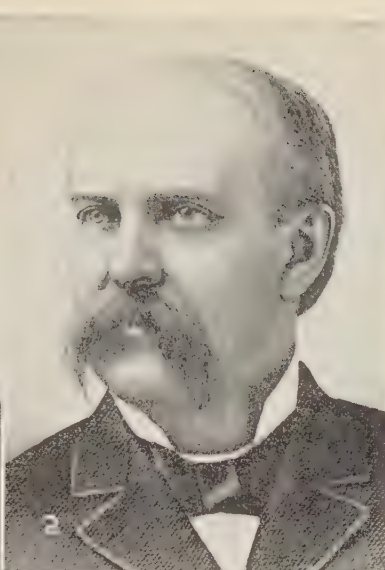
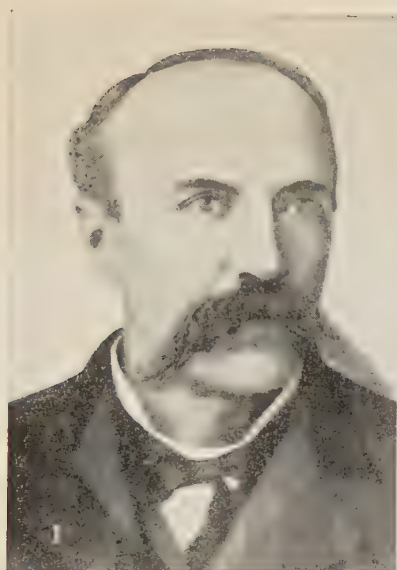
The coal fields of Colorado are divided by the major ranges of the Rocky Mountains into three general groups designated as the eastern, the park, and the western. The eastern group, the most highly developed of the three, comprises the Denver region and the Canon City and Trinidad fields. The park group includes the little known and almost undeveloped fields of the South, Middle, and North parks. The western group, the largest in area, which contains the greatest amount of coal, includes the Yampa field on the north, the Danforth Hills, White River, and Grand Hog-

back fields north of Colorado River, the Glenwood Springs, Crested Butte, and Grand Mesa fields south of Colorado River, the Book Cliffs field west of Grand Junction, and the Durango field in the southwestern part of the state. All of these fields of the western group, with the exception of the Yampa field, in the extreme north, and the Durango field, in the south, belong to the great Uinta region, or basin, which extends from Gunnison County, Colorado, on the east to Carbon and Emery counties, in the central part of Utah, on the west.

In quality the coals of Colorado range from subbituminous ("black lignite"), in the Denver region, through various grades of bituminous, including the high-grade coking coal of the Trinidad and Glenwood Springs fields, to true anthracite, in the Crested Butte and Yampa fields. Some of the coal beds of Colorado attain enormous thickness. This is especially true in the Glenwood Springs field, and some of the beds in the North Park field are also said to be of great thickness. The total area underlain by coal in Colorado is estimated at 17,130 square miles, and about 60 per cent of that entire area is believed to contain coal workable under present conditions. There is an extent of territory embracing over 4,000 square miles about which little is known, but which may contain workable coal, and nearly 3,000 square miles of territory in which the coal lies under heavy cover and is not workable on that account at the present time.

PRODUCTION OF COAL IN COLORADO FROM 1864 TO 1925,
IN SHORT TONS.

	<i>Tons</i>	<i>Value</i>	<i>Average price per ton at the mine</i>
1864-----	500	\$ 1,000	\$2.00*
1865-----	1,200	2,400	Do.
1866-----	6,400	12,800	Do.
1867-----	17,000	34,000	Do.
1868-----	10,500	21,000	Do.
1869-----	8,000	16,000	Do.
1870-----	13,500	27,000	Do.
1871-----	15,860	31,720	Do.
1872-----	68,540	137,080	Do.
1873-----	69,997	139,980	Do.
1874-----	77,372	154,744	Do.
1875-----	98,838	197,676	Do.
1876-----	117,666	235,332	Do.
1877-----	160,000	320,000	Do.



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1878	200,630	401,260	Do.
1879	322,732	645,464	Do.
1880	462,747	1,041,181	2.25*
1881	706,744	1,590,174	2.25*
1882	1,061,479	2,388,328	2.25
1883	1,229,593	2,766,584	2.25
1884	1,130,024	2,542,554	2.25
1885	1,356,062	3,051,589	2.25
1886	1,368,338	3,215,594	2.35
1887	1,791,735	3,941,817	2.20
1888	2,185,477	4,808,049	2.20
1889	2,597,181	3,993,768	1.54
1890	3,094,003	4,344,196	1.40
1891	3,512,632	4,800,000	1.37
1892	3,510,830	5,685,112	1.62
1893	4,102,389	5,104,602	1.24
1894	2,831,409	3,516,340	1.24
1895	3,082,982	3,675,185	1.20
1896	3,112,402	3,606,642	1.16
1897	3,361,703	3,947,186	1.17
1898	4,076,347	4,686,081	1.15
1899	4,776,224	5,363,667	1.12
1900	5,244,364	5,858,036	1.12
1901	5,700,015	6,441,891	1.13
1902	7,401,343	8,397,812	1.13
1903	7,423,602	9,150,943	1.23
1904	6,658,355	8,751,821	1.31
1905	8,826,429	10,810,978	1.22
1906	10,111,218	12,735,616	1.26
1907	10,790,236	15,079,449	1.40
1908	9,634,973	13,586,988	1.41
1909	10,716,936	14,296,012	1.33
1910	11,973,736	17,026,934	1.42
1911	10,157,383	14,747,764	1.45
1912	10,977,824	16,345,336	1.49
1913	9,232,510	14,035,090	1.52
1914	8,170,559	13,601,718	1.67
1915	8,624,980	13,599,264	1.58
1916	10,484,237	16,964,104	1.62
1917	12,483,336	27,669,129	2.22
1918	12,407,571	33,404,743	2.69
1919	10,323,420	28,748,534	2.78
1920	12,278,225	42,829,000	3.49
1921	9,122,760	32,377,000	3.55
1922	10,019,597	31,701,000	3.16
1923	10,346,218	33,299,000	3.22
1924	10,444,098	31,863,000	3.05
1925	10,290,000	31,899,000	3.10
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1864-1925	300,382,961	\$581,666,267	\$1.94

*Estimated.

PETROLEUM

Oil seepages were noted as early as 1860 on Oil Creek, near Canon City, and drilling commenced in the early sixties but no real production was made until 1887, when oil was developed south of Canon City, at Florence, Colorado.

1913	-----	11,796	15,366	176,693	159,413	^c 310	188,799	175,089
1914	-----	6,515	9,117	215,548	191,067	^d 710	222,773	200,894
1915	-----	6,376	9,679	202,069	173,506	^a 30	208,475	183,485
1916	-----	5,749	9,902	191,486	207,237	-----	197,235	217,139
1917	-----	5,847	11,510	114,664	115,150	^a 720	121,231	128,100
1918	-----	4,646	10,654	134,895	172,666	^b 3,745	143,286	188,472
1919	-----	5,000	10,400	102,000	152,000	14,000	121,000	183,000
1920	-----	7,000	18,900	88,000	168,500	16,000	111,000	217,900
1921	-----	5,000	10,500	83,000	96,500	20,000	108,000	132,000
1922	-----	4,000	8,200	70,000	76,260	23,000	97,000	114,460
1923	-----	3,800	5,800	62,000	68,240	20,200	86,000	102,340
1924	-----	^e 3,000*	6,000	70,000	70,000	372,000	445,000	490,000
1925	-----	^e 3,000	7,200	70,000	91,000	1,153,000	1,226,000	1,810,000
		533,049	\$731,348	11,350,528	\$10,368,130	1,629,793	13,513,370	\$13,375,888

^a Includes a small production in Garfield County.

^b Includes production of Garfield and Rio Blanco Counties.

^c Includes production of Rio Blanco County.

^d Includes production of Mesa and Rio Blanco Counties.

^e Value of district output estimated 1919-1925.

* Estimated.

The first production of any moment was 76,000 barrels in 1887, followed by 298,000 barrels in 1888. Production at Florence has been small but steady to 1926, as shown in the table. Oil seeps were noted in 1860 at Golden, but no production has been made there to date (1926). The development of oil and gas in the Boulder area began in 1901, though their presence was suspected and rumored as early as 1867. The project of drilling for oil at Boulder was first conceived while prospecting for coal in the Benton formation. The subsequent finding of oil was largely a piece of good fortune, for the oil was found in the highly variable sands or sandstones of the Pierre formation, several thousand feet above the Benton. The oil production began with 11,000 barrels in 1902 and 39,000 barrels in 1903, reached a peak of 85,709 barrels in 1909, and dropped to an insignificant quantity in 1925. But deeper drilling in 1926 gives some promise of production in the Boulder field. After several unsuccessful attempts at drilling for oil at and near De Beque, beginning in 1900, the Grand Valley Oil and Gas Co. drilled a well in 1913 a short distance west of the town and found oil in sandstone at 1,135 feet. The casing collapsed but the gas pressure was sufficient to throw water intermittently to a height of 100 feet. Oil of 42° B. gravity was obtained, as well as gas. A second test, in 1914, found some oil at 1,900 feet but was troubled with water.

In 1910, oil was found in the Rangely field, Rio Blanca County.

Drilling during 1923 in Moffat and Larimer counties led to developments in 1924 that have materially changed the outlook for oil in Colorado. In August, 1923, petroleum was found in beds of Upper Cretaceous shale at a depth of about 2,000 feet on the Hamilton Dome about 13 miles south of Craig, Moffat County. The oil is of high grade, having a gravity of approximately 41° (0.820), and developments in 1924 resulted in the marketing of more oil from this field, known as the Moffat pool, than has been produced in Colorado for a number of years. The bringing in of a large gas well on the Wellington Anticline, near Fort Collins, on November 11, 1923, resulted in a production on the Wellington dome and the Fort Collins dome, in 1924, 1925, and 1926.

FLUORSPAR

The mining of fluorspar in Colorado dates back to the early seventies, when about 600 tons was produced from a deposit southwest of Evergreen, Jefferson County. About 1873 or 1874 fluorspar is reported to have been shipped from the Poorman claim, near Jamestown, Boulder County.

From the early seventies to 1903, when the first basic openhearth steel furnace was started at Pueblo, Colorado, it is believed that most of the fluorspar produced in Colorado was used in smelting gold and silver ores. The demand was therefore small and the output probably did not amount to more than 3,500 tons, all of which, with the exception of 600 tons from Jefferson County, was produced in Boulder County. Between 1903 and 1912, in addition to Boulder County, small quantities of fluorspar were produced from time to time in Custer, El Paso, Park, and Jefferson counties. These outputs, however, were not sufficient to supply the demand at the steel plant at Pueblo and considerable quantities of fluorspar were shipped from the Illinois-Kentucky district to Colorado.

In 1911 fluorspar was recognized at a deposit near Wagon Wheel Gap, Mineral County, and by 1913 development had progressed to the extent that shipments were made to the steel plant at Pueblo, Colorado. Small shipments were also made in 1914 but none was sold in 1915. In 1916 greater demand and higher prices resulted in reopening the mine and besides the fluorspar shipped to the Colorado Fuel & Iron Co. and to consumers on the Pacific Coast, shipments were made to eastern markets. This mine has furnished more than one-half of all the fluorspar produced in Colorado.

Next to Mineral and Boulder counties the largest production has come from a mine near Cowdrey, Jackson County. The first shipments, amounting to a few carloads, were made in 1922.

All of the fluorspar produced in Ouray County has been obtained near Ouray. The initial shipment was in 1917. Additional shipments were made in 1918, 1924, and 1925.

A deposit near Duffields, El Paso County, yielded a small quantity of fluorspar during 1911 and 1912. In 1917 a

vein of fluorspar was opened near Cather Springs, El Paso County, from which 600 tons was produced that year and 900 tons in 1918, after which it was abandoned.

About 800 tons of fluorspar was shipped from deposits near Rosita, Custer County, during 1906 and 1907. In the northwestern part of Custer County, near the Fremont County line, a deposit of fluorspar near Cotapaxi was opened in 1923, from which shipments amounting to several hundred tons were made to the steel plant at Pueblo, Colorado, during 1923, 1924, and 1925.

A complete record of shipments of fluorspar from Colorado prior to 1905 has not been obtained. It is believed, however, that the total fluorspar mined up to 1904 did not exceed 4,400 tons. The shipments reported for 1905 to 1925 amounted to 137,452 tons, or about 5 per cent of the total recorded for the United States since 1880.

FLUORSPAR PRODUCED IN COLORADO, 1870-1925.

<i>Year</i>	<i>Short Tons</i>	<i>Value</i>
1870-1904	4,400	\$ 26,400
1905	1,156	8,200
1906	300	1,800
1907	3,300	11,400
1908	701	4,266
1909	350	2,100
1910	268	1,608
1911	721	4,226
1912	1,639	9,834
1913	4,432	26,592
1914	1,978	12,992
1915	247	1,482
1916	8,669	42,457
1917	17,104	196,633
1918	38,475	416,780
1919	9,687	150,739
1920	12,852	251,308
1921	3,143	39,907
1922	2,309	20,169
1923	6,044	59,710
1924	12,301	135,411
1925	11,776	153,707
	141,852	\$1,577,721

OIL SHALE

In the ninth annual report (1887-1888) of the director (J. W. Powell) of the United States Geological Survey, Geologist C. A. White made a strictly scientific report on

the geology and physiography of a portion of Northwestern Colorado and adjacent parts of Utah and Wyoming. His map and text described in detail the area of the Tertiary Green River formation and mentions that this formation includes carbonaceous layers. Some time before 1913 it was called to the attention of the U. S. Geological Survey that some of the shale of the Green River formation would produce oil when subjected to destructive distillation. Examination of Mr. C. A. White's report indicated the large area of the Green River formation and in 1913 E. G. Woodruff and David T. Day of the U. S. Geological Survey began an examination of the Green River formation in Colorado and Utah and made rough field tests to determine the richness of the shale. During the summers of 1914 and 1915, the field examination was continued by Dean E. Winchester, who confirmed the results of the work done and indicated even more strongly than Woodruff and Day that a great quantity of fuel is locked up in this shale. Mr. Winchester and his assistants made detailed studies to determine the exact areas of C. A. White's Green River formation and took samples at many places. These samples were distilled in the field and in the laboratory of the U. S. Bureau of Mines, at Washington, to determine the quantity of oil which could be obtained from them.

In 1923, the U. S. Geological Survey published its Bulletin 729 on oil shale of the Rocky Mountain Region, by Dean E. Winchester. Mr. Winchester in that report says:

By far the most extensive and rich oil shales of the United States and perhaps of the world belong to the Green River formation of Colorado, Utah, and Wyoming and the Tertiary shales (Green River?) of Nevada. * * * After a careful study of the thickness and oil-yielding capacity of the (Green River) shales * * * it is estimated that if 60 per cent of the total shale in northwestern Colorado existing in the ground as beds 3 feet or more thick and yielding at least 15 gallons to the ton were treated in retorts it would produce a total of 40,640,000,000 barrels (42 gallons each) of crude shale oil.

A large part of the valuable oil shale of the Western United States is on Government land, at the present time about 896,000 acres in Colorado, 2,696,000 acres in Utah, and 460,000 acres in Wyoming being classified as mineral land chiefly valuable for its oil shale. The lands so classi-

fied, with the exception of two relatively small areas, one each in Colorado and Utah, which have been set aside for the use of the United States Navy and comprise only about 3 per cent of the total area, are open to nonmineral entry (homestead, etc.) in accordance with the act of Congress dated July 17, 1914, and to lease for their oil shale in accordance with the act of Congress dated February 25, 1920. Under the act of July 17, 1914, the mineral deposits in all entries are reserved for separate acquisition under the mineral-land laws, and under the leasing law passed February 25, 1920, a maximum area of 5,120 acres of oil-shale land may be leased by certain individuals or associations of individuals for indeterminate periods upon such conditions as may be imposed by the Secretary of the Interior.

Naval oil shale reserve No. 1, Colorado No. 1, comprises 45,444 acres in Tps. 5 and 6 S., Rs. 94 and 95 W. sixth principal meridian, and lies on the north side of Grand River between Rifle and Grand Valley. Naval oil shale reserve No. 2, Utah No. 1, comprises 86,584 acres in Tps. 12 and 13 S., Rs. 18 and 19 W., and lies between Hill Creek and Green River about 25 miles west of Watson, Utah. Naval oil shale reserve No. 3 is a strip of land surrounding No. 1.

In 1922, the U. S. Bureau of Mines published its Bulletin 210, in coöperation with the State of Colorado—an historical, technical, and economic study of oil-shale, by Martin J. Gavin.

In the meantime, under a coöperative agreement with the Colorado state oil inspector and the U. S. Bureau of Mines, an oil-shale laboratory was maintained at the University of Colorado, at Boulder.

Results of work at this laboratory prepared the U. S. Bureau of Mines to accept an appropriation of \$90,000 by Congress for the fiscal year ending June 30, 1926, and another of \$89,000 for the year ending June 30, 1927. On September 18, 1926, and following, continuous runs were made at Rulison, Colorado, of the 10-ton Scotch (Pumpherson) retort and a 10-ton American (N. T. U.) plant is now (October 1, 1926) about ready for a trial operation.

RADIUM, URANIUM, AND VANADIUM FROM CARNOTITE

The analysis of carnotite gives approximately uranium oxide 59 per cent and vanadium oxide 20.5 per cent. The



MINING AND INDUSTRIAL EXPOSITION, DENVER, 1882

composition of the mineral is approximately K_2O , $2UO_3$, V_2O_5 , H_2O .

Coffin¹ says the existence of a yellow substance in the sandstone of the Paradox Valley country was known to settlers of the region before 1880. Fleck² and Haldane suggest that the Ute and Navajo Indians probably used this yellow powder as a pigment even before white people came to the region.

In 1898, through the agency of Gordon Kimball, of Ouray, some of this yellow mineral was placed in the hands of Charles Poulot, a French chemist, who determined that it contained uranium and in sufficient quantity to make it commercially valuable. The mining of carnotite dates from this time and received impetus from the discovery that other elements were an integral part of its make up. In 1899, M. M. C. Friedel and E. Cumenge determined the approximate analysis of this mineral and named it carnotite, after the French scientist, Adolphe Carnot.

The real incentive, however, to mine these ores came through a chain of events which began with the discovery of radium of M. and Mme. Curie in 1898, and led to the discovery that all uranium ores contained this new element. Experiments with radium soon astonished the medical profession by revealing its action on certain cancerous growths, and the search which followed for uranium ores was the beginning of an industry which became a more or less permanent fixture in the mining scheme of Colorado until 1921, when ores twenty times as rich in uranium content were developed in the Belgian Congo.

The pioneers of carnotite mining entered the Colorado field in 1910. Activity in mining these ores increased each year from 1910 until 1914, when the war stopped their sale. Up to that time they had been largely sold to foreign buyers. After the slump of the carnotite market at the beginning of the war, demand for this ore increased, al-

¹ R. C. Coffin, "Radium, Uranium and Vanadium Deposits of Southwestern Colorado," *Colorado State Geological Survey Bull.* 16, 1921.

² Herman Fleck and W. G. Haldane, "A Study of the Uranium and Vanadium Belts of Southern Colorado," *Colorado State Bur. Mines Twelfth Bienn. Rept.*, p. 47 (1907).

though not uniformly, until in 1919 the quantity of ore mined exceeded that of any previous year.

Three factors contributed to the demand for carnotite since the discovery that radium could be used in treatment of certain cancers. These factors are: First, the making of a luminous paint based upon the peculiar properties of radium; second, the establishment in the United States of concerns which extract the radium from its ores and put it in marketable form; and third, the recent demands for vanadium in manufacturing vanadium steel.

The first mining of carnotite centered around an area on Roc Creek near what is now the post office of Uranium. Gordon Kimball, of Ouray, Talbert brothers, of Paradox, Ike Hallet, of Norwood, and others have contributed information concerning the first work of the region.

In 1881 Tom Talbert sunk a shaft within the boundaries of what is now a claim on Roc Creek and sent some of the "yellow mineral" to an assayer in Leadville, who reported that the material contained gold and traces of silver. Several other attempts were made to determine the elements present in the mineral, but without success. The Roc Creek claim was staked by other prospectors during the next few years, but each in turn found nothing of value in the material and let the claim lapse. In 1887 the ground was relocated and named the Copper Prince on the supposition that the minerals present included "chrome-copper." However, the "chrome-copper" was not marketable and the property was soon abandoned and remained idle for several years. About 1896 a prospector by the name of Tom Dullan relocated and held the Roc Creek claims until 1898, when Mr. Kimball and associates acquired a bond and lease on the properties and made the first shipment of carnotite ore. This shipment consisted of 10 tons of ore which averaged over 20 per cent uranium oxide (U_3O_8) and 15 per cent vanadium oxide (V_2O_5). It is doubtful if the initial shipment from any other claim has ever equaled the one made by Mr. Kimball. The details of this first mining of carnotite have been written by Mr. Kimball.³

³ Gordon Kimball, "Discovery of Carnotite," *Eng. and Min. Jour.*, vol. 77, p. 956 (1904).

Soon after the first shipment of carnotite it became generally known that the "yellow mineral" was of value and claims were staked at many places. Among the first claims staked outside of the Roc Creek area were those located in 1899 by Ike Hallet on ground now partially covered by the Salt Lick claim near the Shamrock camp of the Standard Chemical Company. Other claims were located this same year near Hydraulic and on La Sal Creek. The claims on La Sal Creek included the Yellow Bird, which became noted for its production of high-grade ore.

In 1900 M. Poulot became associated with a M. Voilleque and together they did experimental work at the Cashin mine, by which they attempted to extract uranium and vanadium oxides from carnotite. The ore upon which they experimented was mined on Roc Creek, near Hydraulic, and on La Sal Creek. This experimental work led to the formation of a company which included, beside the two experimentors, James McBride, who was interested in the early development of the Cashin mine. In 1901 this company built a mill in the McIntyre District at the mouth of Summit Creek and shifted the center of operations to this region. Mining and milling of carnotite ore were carried on intermittently in this region from 1901 to 1904. Details of the operations of this company and other early activity have already been written by Fleck⁴ and Haldane. Carnotite mining before 1904 was practically limited to this one area, and had the recovery of uranium as its primary object and vanadium as a secondary one.

Aside from some experimental work, nothing of importance happened in the carnotite country after 1904, until about 1910, when individuals who eventually represented the interests of the General Vanadium Company acquired property in Paradox Valley. The Crucible Steel Company became interested in Long Park claims about this time, and in 1910 the Standard Chemical Company purchased from one of the Talbert brothers claims that are now included in their Thunderbolt group. From this date the mining of carnotite has expanded to a very considerable business in 1920. This growth was irregular and fraught with

⁴ Op. cit. pp. 47-117.

many difficulties; districts had to be opened in an unsettled and semi-arid country; processes of ore treatment had to be worked out and perfected, and market established for the refined products. Transportation still remains one of the biggest problems of carnotite mining. Although progress has been made in methods of milling low-grade ore, much remains to be done in this phase of the work.

Early in 1912, according to Parsons, Moore, Lind, and Schaefer,⁵ from information received by the Bureau of Mines, it became evident that quantities of valuable radium-bearing ore from Colorado were being exported for manufacture in foreign countries and that at least part of the manufactured produce was being returned to this country and sold at a price entirely incommensurate with that received by the miner and the prospector. Consequently, in line with its efforts to increase efficiency in the mining and treatment of mineral resources, the Bureau of Mines undertook an investigation of conditions. Results of this preliminary investigation were published, in the summer of 1913, as Bulletin 70,⁶ which gave an outline of the radium deposits of the West, the conditions of mining, the wastes involved, and the status of the production of radium from its ores.

At about this time newspapers and medical journals were publishing statements regarding the value of radium in cancer therapy. These reports, although many of them were exaggerated, brought out clearly the remarkable virtue of the gamma rays for the treatment of cancer and other malignant growths. In view of the fact that the largest known supplies of radium ore in the world were then in the states of Colorado and Utah and on the public lands of the United States, it was deemed highly important for the Bureau of Mines to study the production of radium in detail. Such study, it was hoped, would enable the prospector and miner to obtain a fairer price for the ores

⁵ Charles L. Parsons, R. B. Moore, S. C. Lind, and O. S. Schaefer, "Extraction and Recovery of Radium, Uranium, and Vanadium from Carnotite," U. S. Bureau of Mines *Bulletin* 104, 1915.

⁶ R. B. Moore and K. L. Kithill, "A Preliminary Report on Uranium, Radium, and Vanadium," *Bulletin* 70, Bureau of Mines (1913), 101 pp., 4 pls., 2 figs.

and would furnish information necessary in case Congress appropriated funds to develop methods for extracting radium from ore on the public lands under Government supervision, to be supplied at cost to the hospitals of the army, navy and public health service.

In 1921, according to Hess,⁷ the producers of radium for Colorado and Utah ores carried stocks so large—a few thimblefuls each—that they sold much of their product for prices that did not allow a proper profit, and they started the year 1922 with probably between \$1,000,000 and \$2,000,000 tied up in radium and with considerable ore on hand. Worse than these conditions was the fact that they faced the competition of the extremely rich and cheaply produced ore Katanga, in the south end of the Belgian Congo, so their outlook was very poor.

In 1922 only 929 tons of dry carnotite ore were mined and shipped from Colorado and Utah. That year the Katanga radium ores (which do not contain vanadium) continued to dominate and almost absorb the market for radium.

In 1923, the mining of uranium-vanadium ores in Colorado and Utah was reduced to a very small industry as the newly exploited uranium deposits in Katanga came into large production. Such was also the situation in 1924, 1925, and 1926.

According to Kithil,⁸ there were produced from beginning to October 1, 1926, from carnotite ores mined in Colorado and Utah (the greater quantity from Colorado ores), approximately 45,000 tons yielding approximately 165 grams of the radium element in the form of radium salts. The average sales price of \$110,000 per gram, based on the radium element content, gives a total sales value of \$18,000,000.

The vanadium in these ores averaged about 3 per cent V_2O_5 , so that the carnotite produced during the whole period of carnotite mining contained about 1,350 tons of V_2O_5 . Of this, only a small quantity (perhaps 30 per cent)

⁷ Frank L. Hess, "Radium, Uranium, and Vanadium," *U. S. Geological Survey Mineral Resources for 1922*, p. 575 (1925).

⁸ Private correspondence from K. L. Kithil.

was recovered and sold as iron vanadate or vanadic acid, for these ores were primarily treated for their radium content. The vanadium recovered and sold amounted to 900,000 pounds of V_2O_5 , with a sales price of 85 cents per pound, or \$765,000.

The uranium in these ores amounted to approximately 900 tons of U_3O_8 , but little was recovered in the treatment of the ores because of a lack of market for uranium.

RADIUM FROM PITCHBLEND, A VARIETY OF URANINITE

Pitchblende was known to occur in Gilpin County as early as 1872. Its occurrence was only of academic interest until the interest developed in radium about 1904. The greatest activity in the mining of pitchblende was in 1913 at the German & Belcher, Wood, Kirk, and Calhoun mines. Much of the pitchblende ore of Gilpin County was sold for specimens. Pitchblende was also found in the Jo Reynolds mine, Clear Creek County. The quantity of radium extracted from Gilpin County ores was small.

VANADIUM FROM ORES OTHER THAN CARNOTITE

In 1922, Hess⁹ said that although for the last several years vanadium had been produced in the United States only as a by-product of radium production, it seemed certain that vanadium will again be obtained from the vanadium-uranium bearing sandstones of Colorado and Utah. The deposits are found from a point about 15 miles north of Meeker, Routt County, to Navajo Mountain (on the boundary line between New Mexico and Utah) in a belt more than 200 miles long and 50 miles wide.

Hess,¹⁰ in 1923, said that during 1923, vanadium ore as such was produced in the United States only at Rifle, Colorado, and on Yellow Cat Wash, near Thompsons, Utah, and only small shipments were made.

The American ores have been produced chiefly as a by-product in the isolation of radium from the carnotite ores

⁹ Op. cit.

¹⁰ F. L. Hess, "Rare Metals, Mineral Resources of U. S. for 1923," *U. S. Geol. Survey*, pp. 250-251, 1924.

of Colorado and Utah. The deposits occur in loosely cemented sandstones. The radium-bearing mineral carnotite also carries about 20 per cent of vanadium oxide (V_2O_5) and is accompanied in American deposits by several other vanadium minerals, the principal of which is an imperfectly known mica-like mineral in exceedingly minute flakes a thousandth of an inch or less in diameter, filling spaces between the sand grains of the rock. Besides the micaceous mineral the ore carries hewettite and metahebettite (which have the same chemical composition but different optical properties), uvanite (hydrous uranium vanadate), vanoxite (black hydrous vanadium oxide), and other vanadium minerals.

The ores almost invariably carry more vanadium than uranium, and around the carnotite is an envelope of dark vanadium-bearing rock carrying as much as 8 per cent of vanadium oxide, though usually less, but most of the deposits are small, containing only a few hundred tons of ore carrying from 2 to 4 per cent of vanadium oxide. Most of the deposits are a long way from the railroad—40 to 70 miles over poor roads—so that mining and delivery are expensive.

On account of their low grade and high cost of mining and delivery the ores have yielded a profit only when worked in connection with radium. In the course of this process the vanadium was dissolved, obtained either as hydrous iron vanadate or as oxide, and by most companies sold to manufacturers of ferrovanadium. The product had a high degree of purity and was in good demand. The Standard Chemical Company, of Pittsburgh, and the Radium Corporation of Colorado, of Denver, made ferrovanadium from their own salts. The United States Radium Company in 1913 still made vanadium salts as a by-product, and the Standard Chemical Company experimented with the concentration of the mined ores that it had on hand in San Miguel County, Colorado, 60 miles northwest of Placerville, for their vanadium content.

The Vanadium Corporation of Colorado in 1923 leased its property near Rifle to the United States Vanadium Company, which built a concentration and reduction plant at

Rifle for the manufacture of vanadic acid and iron vanadate. It may afford an outlet for other ores of similar type that will bear transportation—for instance, some of the ores of the La Sal Mountain region.

A somewhat similar type of ore is the roscoelite-bearing sandstone formerly extensively mined near Placerville and Vanadium, San Miguel County, Colorado. These ores are very simple and contain no deleterious minerals. Bodies of ore could be selected that carried 3 per cent of vanadium oxide scattered through sandstone from 1 or 2 inches to a maximum of 36 feet thick. The bodies were generally flat lenses and some were several hundred feet wide. The Primos Chemical Company worked the deposits for years with a plant at Vanadium for producing hydrous ferric vanadate, which was shipped East for reduction to ferrovanadium. For a while men having smaller capital mined portions of the ore that carried 3 per cent metallic vanadium for shipment to England. Later the Colorado Vanadium Company established another plant at Sawpit. Then the Primos Chemical Company sold its property and business to the Vanadium Corporation of America, which later closed the property, as it could produce its vanadium more cheaply from its Peruvian deposits. The Colorado Vanadium Company was unsuccessful, and no work has been done in the area for several years. Opinions differ sharply as to whether commercially important quantities of ore remain.

These two types of vanadium deposits (the uranium-vanadium and the Placerville roscoelite), wholly unknown elsewhere, produced from 1912 to 1918, inclusive, 2,750 metric tons of vanadium, against 3,398 tons of vanadium (official Peruvian figures) in shipments of ore from Peru.

According to local information, the vanadium sandstone near Rifle, Colorado, opened in 1922, developed in 1923, milling beginning in 1924 and continuing in 1925, with an increase in mill capacity in 1926 to 110 tons per day, has supplied up to September, 1926, about 13,000 tons of vanadium ore, with a recovery of 700,000 pounds of V_2O_5 in the form of vanadic acid (75 per cent V_2O_5), with a sales value of \$1.00 per pound of V_2O_5 contained, or a total value of \$700,000.

IRON AND IRON-MANGANESE

Iron smelting in Colorado was done at Langford, about 1872, by Mr. W. S. Marshall, the owner of the Marshall coal mine, Boulder County. The iron ore used was mined in the immediate vicinity of the coal mine, but after a fair trial the supply of iron ore proved insufficient and the furnace was abandoned. It is reported that in a run of two months Mr. Marshall produced 250 tons of pig iron.

The Colorado Coal & Iron Co., organized January 23, 1880, was the forerunner of the Colorado Fuel & Iron Co. Among the assets of the Colorado Coal & Iron Co. in 1882 were 1,057 acres of iron land, embracing Iron Mountain, a deposit of magnetite iron lying on Grape Creek, between Canon City and Silver Cliff; 300 acres of magnetite iron ore at Calumet and Whitehorn, northeast of Salida, known as the Calumet & Hecla and Smithville iron mines; over 100 acres of hematite ore near Mineral Hot Springs, or Orient. In addition, the company in 1882 had a lease on the Placer iron mines, near Placer station, near Russell, and a lease to work other mines in the Trinchera estate. James M. Swank (in *Mineral Resources*, U. S. Geol. Survey, for 1881-82, p. 137) shows production of iron and steel rails in Colorado beginning in 1878 of 1,600 tons; in 1879, of 2,500 tons; in 1880, of 4,500 tons; in 1881, of 1,643 tons; and in 1882, of 18,217 tons, but he does not state the source of the ore for 1878 to 1881. He reports that the first rail was rolled at the steel mill of the Colorado Coal & Iron Co., at South Pueblo, on April 12, 1882, and the nail mill was started September 15, 1882. He reports the production of iron ore by this company in 1882 as 14,202 tons from the South Arkansas (Calumet) mine, 29,190 tons from the Hot Springs (Orient) mine, 8,378 tons from the Placer mine, 854 tons from the Silver Cliff mine, and 801 tons from the Grape Creek mine. He reports magnetite ore on Cebolla Creek, a short distance above its junction with the Powder Horn Creek, red hematite at Morrison (used that year and a short time afterward for manufacture of paint in Denver) and iron ore at Como.

Mr. F. F. Chisolm¹¹ in 1885 reported that the iron-ore mines of Colorado which have been developed are owned by the Colorado Coal & Iron Co. Other deposits were known but not opened.

One of these mines was the Placer mine on the Trinchera estate on the west slope of the Culebra range, in Costilla County. The mine had been quite extensively opened but was abandoned in 1883 because the ore became too mixed to allow of sorting at the mine. Tests of other mines in the neighborhood had proved that the ore was of the same character. In all 14,775 tons of iron ore was produced from this mine.

The Grape Creek mine lies at the head of Pine Creek, in the Wet Mountains of Custer County. The ore is a refractory magnetite carrying 13 to 15 per cent of titanite acid. Up to May 1, 1884, only 921 tons had been mined. The ore was used for fettling the company's puddling furnace.

The Hot Springs mine (Orient) lies on the western slope of the Sangre de Cristo range. Chisolm says the ore was a porous brown hematite of pure character, occurring in isolated masses on the slopes of the sharply rising foothills, that there were then no regular or continuous ore bodies, and that the ore was mined from open cuts.

The South Arkansas mine (the Calumet & Hecla and Smithville mines) near Calumet and Whitehorn, was situated 19 miles from Salida and included six mining claims and embraced 700 acres. The ore body was opened by an adit 796 feet long and an incline shaft 290 feet in depth. From the developments in 1884 it was estimated that the quantity of ore in sight was 179,600 tons, or conditional upon certain further developments, 236,000 tons. Officers of the company estimated the exposed ore at a much greater figure. Some of the ores from this region contained quite large quantities of iron pyrite and had to be roasted.

The production of Colorado iron ores from 1882 to 1885, as shown by the production of the Colorado Coal & Iron Co., was as follows:

¹¹ Iron in the Rocky Mountain Division: *Mineral Resources*, U. S. Geological Survey for 1883-4, pp. 281-285, 1885.

Iron ore mined by the Colorado Coal & Iron Co., 1882-85.

Year	South Arkansas	Hot Springs	Placer	Silver Cliff	Grape Creek	Total
1882	14,202	29,190	8,378	584	801	53,425
1883	19,645	25,939	1,513	---	---	47,097
1884	10,483	12,406	---	---	---	22,889
1885	2,902	550	---	---	---	3,452
	47,232	68,085	9,891	854	801	126,863

Mineral Resources for 1883-4 reports 236 tons of spiegeleisen made in Colorado in 1884 (the iron-manganese probably coming entirely from Leadville, Colorado).

In 1887, *Mineral Resources* reported 12,123 tons of magnetite ore from the Calumet mine and 19,556 tons of red hematite ore from the Orient mine. That year much iron ore was purchased by the Colorado Coal & Iron Co., and of that much came from the Breece iron mine at Leadville.

In 1888, only one of the two blast furnaces of the Colorado Coal & Iron Co. was in blast continuously. This company was the only operator of iron mines in the state and its mines at Calumet, with a production of 5,659 tons of magnetite ore and at Hot Springs (Orient) with a production of 19,954 tons of hematite ore, were able to supply the furnaces when supplemented by special iron ores from Leadville. During 1888, this company also used 2,808 tons of iron-manganese ore from Leadville and made some spiegeleisen.

In 1889 Colorado produced 4,821 tons of red hematite, 100,421 tons of brown hematite, and 3,894 tons of magnetite ore, but this large tonnage of brown hematite and probably some of the red hematite was mostly argentiferous iron-manganese ores used as flux in lead smelters.

In 1890, Colorado produced 14,689 tons of red hematite, 95,577 tons of brown hematite and no magnetite ore, but again the brown hematite ores are probably mostly argentiferous iron-manganese ores and from that year on the argentiferous iron-manganese ores for flux are credited to iron ores, to iron-manganese ores, and to silver ores, thus trebling the figures, and time is not available to separate.

Red hematite continued to be produced to 1905 and magnetite to 1898, when the Calumet deposit had turned to pyrite. About 1900, the Colorado Fuel & Iron Co. began to draw its iron ores from Sunrise, Wyoming, and from Fierro, New Mexico. The Orient mine was reopened in 1923. There are deposits of iron ore on Cebolla Creek, Hinsdale County, at the head of Taylor Park, Gunnison County, and at Caribou, Boulder County.

The iron-manganese ores of Leadville (averaging 16 to 48 per cent in manganese) were used for making spiegeleisen and ferro-alloys in considerable quantity from 1890 through 1909, when there was a lapse in the sale of this character of ore until 1914, the quantity sold being increased in 1915, and greatly increased during the World War in 1917 and 1918, dwindling to no sales in 1922. The iron-manganese ores of the Black Iron at Red Cliff were also sold to steel plants in the '80s and again in 1924 and 1925.

MOLYBDENUM

The World War opened the field for the development of Colorado's enormous molybdenum deposits at Climax (Freemont Pass) but the market ceased with the war and not until 1924 were the deposits reopened. Developments in 1926 have revealed that the deposits are larger than previously imagined and by December 31, 1926, the daily tonnage milled was 800 tons, the largest tonnage from any single mine in the state.

TUNGSTEN

Production of tungsten, another rare metal, began in Colorado in 1904, and the production has been very considerable. The principal ore bodies of this mineral are near Nederland, Boulder County, with smaller bodies near Ouray and Ophir.

BISMUTH

Bismuth has been recovered from the Leadville gold ores and also from ores from Hall Valley, Park County, and over the ridge in Summit County.

CHAPTER XI

AGRICULTURE

By Daniel W. Working

THE RELATION OF AGRICULTURE TO SOCIETY —
ABORIGINAL AGRICULTURE — FIRST EFFORTS AT
AGRICULTURAL SETTLEMENT — FIRST PERMANENT
AGRICULTURE—AGRICULTURE AND EARLY MINING—
IRRIGATION: BEGINNINGS AND DEVELOPMENT —
EARLY GRIST MILLS—LARGE CANALS AND RESER-
VOIRS—THE STRUGGLE WITH NATURE—AGRICUL-
TURAL ORGANIZATIONS—STATE EFFORTS TO
PROMOTE AGRICULTURE—PRINCIPAL FIELD CROPS—
HORTICULTURAL CROPS—THE TRUCK-GROWING IN-
DUSTRY—THE HONEYBEE AND ITS PRODUCTS—THE
ECONOMIC VALUE OF AGRICULTURAL PRODUCTS.

THE RELATION OF AGRICULTURE TO SOCIETY

Agriculture is the first of the industries. Historically, it is first, because primitive man began to find support for himself by eating the products of the earth—the fruits and herbs which grew without his thought or effort and offered themselves for the gathering; the game animals found in the woods and the waters near at hand which were his for the taking. After food came shelter—clothing of the simplest or most elaborate character; housing, whether in cave or tree-top, or the more pretentious man-made tent or igloo, tepee or wickiup, hut or mansion, or other movable or permanent habitation of man. The time came when men found it worth while to grow the plants that furnished them food; the time came also when they found it wise to raise and care for the animals which furnished them food and the materials for clothing: and then man made one of his great forward marches. He looked ahead and planned and prepared for the future: he became an agriculturist.

As the simple food and clothing of primitive man were agricultural products—coarse grains, fruits in native wildness, untanned skins and rough fabrics of wool and goats' hair and linen—so our choicest modern foods and woven stuffs are from the farms. But not all the food and clothing of the modern man and woman is directly from the farm. Wheat is produced by the farmer, but the flour for our bread is made in the city by the miller. Agriculture has lost certain elements that made it the first of the arts and industries of long ago. Milk is produced on the farm, but butter is made chiefly in the city; wool comes from the small flocks of the farms and the large flocks of the great ranches and ranges, but woollen goods are no longer woven in country homes. The home handicrafts that were characteristic of the farms of only a few generations ago, to say nothing of the country manufacturing system of a few hundred years in the past, has practically disappeared within the memory of living men. The farm has lost to the city—has lost its arts and its artisans; has lost much of its industry and largely of its population. Much of this is only a relative loss; and much of it is a loss that has certain of the values of gain. The farmer still feeds the world; but he feeds it with products finished in the city. Of old, he sold flour; now he sells wheat. Of old, he sold pork; now he sells pigs. Of old, he was a producer and also a transformer, or manufacturer, of his own products; now the great mills grind the wheat he used to grind at home, the great packers take his hogs and cattle and transform them into food ready for the consumer.

But the farmer is still running a big business. In Colorado he raises more sugar beets than are grown in any other state of the Union; he counts his cattle and his sheep by the million; he irrigates some three millions of acres every year, and on these acres produces crops worth seventy millions or more; he farms two or three millions of acres without irrigation, on which his crops and stock products amount to thirty or forty millions; and he ranges his herds and flocks on the plains and in the mountains wherever grass and other forage may be found, and he markets a portion year by year to feed the hungry and those too well fed to know hunger. The orchard products and the millions

of bushels of potatoes need only to be mentioned. All of these the farmer is producing in Colorado to satisfy a universal demand; and more than he is now producing, and of better quality, he will produce as the demand increases.

ABORIGINAL AGRICULTURE

The archaeologists have told us that there was a primitive agriculture in parts of Colorado—an agriculture so old that by comparison our present historical agriculture seems to be but of yesterday. Men lived within the confines of this state hundreds or even thousands of years ago. And of course they lived on Nature's free products, or on these as modified by man. They who laboriously erected the cliff dwellings in the southwestern part of the state did better than to gather the pinon nuts and other vegetable products that grew of themselves and were suitable for human food; they did more than to hunt and fish for animal food for themselves and their children. These early settlers, who came into this region in the remote past and remained for hundreds of years, building their houses, rearing their families, and developing what seems to have been a genuinely satisfying culture, were real farmers and stock-growers: they planted, cultivated, harvested, and stored their crops of corn and beans and pumpkins; they bred and cared for their sheep, from whose wool they made their clothing: and so they were a self-supporting agricultural people. But they passed away, and only the more enduring articles of their handiwork remain to testify to their intelligence and skill and to mystify us and make us wonder how they lived and thrived. No; more than the work of their hands remains: for occasionally an archaeologist digs up a jar of beans or corn where some thrifty farmer may have put it aside a thousand years ago. Well may we reflect in our pride that these simple people of long ago may have been wiser in their day of prosperity than we are in our own.

A hundred years ago, when white men of French and English extraction were beginning to be familiar with the portion of the earth we now call Colorado, the region was irregularly occupied and used as a hunting ground by various tribes of Indians. These men of the plains and

mountains were not farmers in the sense that the prehistoric people were: they were not planters and cultivators and harvesters of crops, though they did have horses, which they must have learned to use and raise after the early exploring Spaniards had unintentionally stocked the Southwest with these animals. However genuinely agricultural the Indian tribes of the East and of the prairie region may have been, we have little evidence that Indians actually raised corn and pumpkins in Colorado before the coming of the white men during the first half of the nineteenth century. As already indicated, the Indians of the high plains and of the mountains were not farmers: they were hunters, and depended largely for their subsistence on the herds of buffalo that roamed the country by thousands, or even millions, if the estimates of the early travelers may be trusted. So, after the agricultural period of the cliff-dwellers, we may be sure that there was practically no settled agriculture in Colorado until the Mexicans came up from New Mexico in the early 1850s.

THE FIRST EFFORTS AT AGRICULTURAL SETTLEMENT

The aboriginal peoples have passed; and now we consider a period that is almost within the memory of the oldest inhabitant¹ of the state. The Indian was still in the land when the earliest efforts of which we have sure knowledge were made to live by agriculture within the limits of the Colorado we now know. A hundred years ago² the Bents were building their first stockade on the Arkansas River. They may not be said to have been agricultural

¹ As a boy of sixteen, Vicente Velasquez was a member of a party that in August, 1854, made a preliminary attempt to establish a settlement at Guadalupe, in Conejos County. The party returned to New Mexico; but in October of the same year returned and established themselves. Mr. Velasquez was still farming on the Conejos River when I visited him October 7, 1924.

² George Bird Grinnell states that in 1865 William Bent testified before a joint committee of Congress that he went to the upper Arkansas in 1824 and had made that region his home ever since. Charles Bent later moved to New Mexico, and was governor at the time of his death during the Taos Rebellion in 1847. (See *Bent's Old Fort and Its Builders*, published by the Kansas State Historical Society.)

settlers, although they kept large numbers of stock, and seem to have been breeders as well as keepers of neat cattle as well as horses and mules. Farnham, who was at Bent's Fort in 1839, says that the stray mules which belonged to the Bents "scented their old grazing ground" as his party approached the fort; and Lieutenant Abert, who spent two months at the fort in 1846, refers in his diary to "the cattle raised³ at this place."

Were crops grown at Bent's Fort shortly after that famous trading-post was built? We seem unable to answer the question in the affirmative. In Lieutenant Abert's diary for August 31, 1846, may be read the following: "Between the fort and the river there is a low piece of ground that was once cultivated, the traces of the 'Acequia,' by which it was irrigated, are yet visible, but the Indians destroyed everything before the owners could reap the fruits of their labor; hence, although the soil gave great promise of being productive, it has ever since been neglected." A week later Abert recorded that "some Mormons came in from near the 'pueblo,' about eighty miles west of this place; they brought us some green pumpkins and corn; neither the sweet potato nor the cabbage has been cultivated." At the time Abert wrote, the "pueblo," which stood where the City of Pueblo stands today, had been occupied four years. Fremont visited it in 1843, when the occupants of the place furnished his party with an abundance of milk. These men were described as "mountaineers, who had married Spanish women in the valley of Taos," and were now "occupied in farming, carrying on at the same time a desultory Indian trade."

³ In his diary for August 29, 1846, Lieutenant Abert mentions a visit to Bent's Fort of a number of Cheyenne Indians, among them O-cum-who-wast (Yellow Wolf)—"a man of considerable influence, of enlarged views, and gifted with more foresight than any other man in his tribe." Abert quoted Yellow Wolf as saying that, "unless the Indians wish to pass away also (like the buffalo), they will have to adopt the habits of the white people, using such measures to produce subsistence as will render them independent of the precarious reliance afforded by the game. He has proposed to the interpreter at Bent's Fort, to give him a number of mules, in the proportion of one for every man in the tribe, if he would build them a structure similar to Bent's Fort and instruct them to cultivate the ground, and to raise cattle."

But before Abert and Fremont had made the records just quoted, Thomas J. Farnham had made specific mention of an attempt at farming. "Five miles above Fort William" [Bent's Fort], he wrote, on July 5, 1839, "we came to Fort El Puebla. * * * It belongs to a company of American and Mexican trappers, who, wearied with the service, have retired to this spot to spend the remainder of their days raising grain, vegetables, horses, mules, &c., for the various trading establishments in these regions." Mention was made that the Arkansas, "some four miles above the post," could be turned from its course over large tracts of land. Noting that the retired trappers were much given to drink, Farnham expressed doubts as to their success as farmers. However, he noted that they had "horses and mules, cattle, sheep and goats." Were the Bents the first white American farmers in Colorado? We do not know; but the facts already presented suggest that they may have been.

In 1842, on his first exploring trip through the West, Fremont stopped at St. Vrain's fort on the South Platte River, but made no mention of farming operations; though in 1843 he stopped at the same place again, and also at Fort Lancaster, which he described as the "trading establishment of Mr. Lupton." He reached this place on the 6th of July, at a time when it was "beginning to assume the appearance of a comfortable farm," with hogs and cattle on the prairie, different kinds of poultry, and "the wreck of a promising garden, in which a considerable variety of vegetables had been in a flourishing condition, but it had been almost entirely ruined by the recent high waters." Here again the question arises concerning beginnings. Lancaster P. Lupton had established himself on the South Platte in 1836. The garden of 1843 may have been the first of Lupton's agricultural ventures; but it would be easy to believe that he had been raising vegetables two or three years before Farnham mentioned the attempts at farming on the Arkansas near Bent's Old Fort. Yet Rufus B. Sage, who was at Lupton's in 1842 and again in 1843, makes no mention of crops, though he did refer to horses, mules and cattle.

Early in 1847, when Frederick Ruxton came riding

down the mountains from one of the passes near Mount Blanca, he found two or three French-Canadians who had settled on the Greenhorn and were living with their Assinaboin and Sioux squaws. "Game being abundant," he wrote, "and the rich soil of the valley affording them a sufficiency of Indian corn, they lead a tolerably easy life, and certainly a lazy one, with no cares whatever to annoy them." And then a prophecy: "This valley will, I have no doubt, become one day a thriving settlement, the soil being exceedingly rich and admirably adapted to the growth of all kinds of grain. The prairies afford abundant pasture of excellent quality, and stock might be raised upon them in any numbers." Commenting on the fact that the fall in price of beaver skins had thrown the great body of trappers out of employment, he remarked "a general tendency amongst the mountain-men to settle in the fruitful valleys of the Rocky Mountains. Already the plough has turned up the soil within sight of Pike's Peak." On the San Carlos he found many spots "admirably adapted for cultivation, with a rich loamy soil, and so situated as to be irrigated with great facility from the creek. "Irrigation," he added, "is indispensable over the whole of this region, rain seldom falling in the spring and summer."

These were the principal efforts that failed. The hunters and trappers who had been left without occupation by changes of fashion were not the men to transform a hunters' paradise into fruitful irrigated fields. Perhaps the time was not ripe. Possibly the gold excitement that led the forty-niners to California lured the hunters from their easy life on the "Arkansa" and its tributaries and from the forts on the South Platte. At any rate, the beginnings which we fondly call "permanent" were yet to be made. However, they may have owed their permanency in part to the partial successes and final failures of those attempted in the golden era of the hunters, trappers and traders—the days when the names of the Bents, the St. Vrans and Lupton were known the country over.

THE FIRST PERMANENT AGRICULTURE

When we speak of the first permanent agriculture of Colorado we mean the agriculture that has been continuous

from its beginning until now. We mean also that it promises to continue indefinitely.

The first agricultural settlers who actually stayed in Colorado and made homes and a living came from New Mexico. In 1851 they attempted to establish themselves on the Culebra near the present town of San Luis. Settlement was also made on the Costilla, probably on both sides of the Colorado-New Mexico line. But the Ute Indians, who for many years had terrorized the people of the New Mexican settlements north of Taos, frightened the settlers away—back to their old homes. In 1852 Fort Massachusetts was established by the United States Government at a point about seven miles above the present town of Fort Garland. This gave promise of protection; and so the effort to establish settlements was renewed. The result was that in 1852 farming communities were established at San Luis and other points on the Culebra, as well as on the Costilla and on the Trinchera. These remained. Farming operations have been continuous at these places from then until now. The people brought with them stock and the common seeds for planting. For a year or two they brought part of their supplies from Taos and other points in New Mexico; but they soon had their own "Mexican" mills for grinding wheat and corn of their own raising, and so became a self-supporting group of people.

There has been dispute concerning the year of the first settlements in the San Luis Valley. Some have made the date as early as 1849. However, the evidence seems to be clear that there were no permanent agricultural communities until 1852, as already indicated. So when Gwinn Harris Heap rode down the valley in July, 1853, he arrived on the night of July 4th at "a small village on the Culebra, inhabited by Mexicans." On the following morning he rode to the "upper hamlets" on the same stream, noting that there were numerous herds of cattle and horses. He also mentioned an invasion of the house where he had slept by lambs, kids, and pigs. On arriving at the Costilla, Mr. Heap noted that on its banks there were "numerous farms" which were skilfully irrigated, but in other respects "cultivated very carelessly by the Mexicans." He added that their crops, "consisting of wheat, corn, beans, and peas,

gave promise of better results than those on the Culebra." He observed also that the settlements were new; that the adobe houses were well built; and that the people were "quiet and industrious." The same year Lieut. E. G. Beckwith, of Capt. J. W. Gunnison's expedition, gave an account of visiting the same region. His report confirmed that of Mr. Heap concerning the settlements, crops, and live stock of this part of the San Luis Valley, which, it is to be remembered, was at the time a part of the Territory of New Mexico.

The example of the pioneers who settled on the eastern side of the San Luis Valley was soon followed by others. In August, 1854, a small party from New Mexico visited the southern part of the present County of Conejos, shortly afterward returning to their homes with so favorable an account that a larger number returned in October and made a settlement on the north side of the Conejos River, naming it Guadalupe. They began their farming operations the following year, and in a few years became a prosperous community. Lafayette Head is usually credited with being the leader of this colony. However, Mr. Vicente Velasquez, the only survivor of the original (August) company who visited the region and decided on the settlement, informed the writer on October 7, 1924, that the actual organizer and leader of both the August and October expeditions was Jose Maria Jacques.⁴

In 1859 settlers established themselves on the Huerfano, as well as in the vicinity of Golden, Denver, and Boulder. Judging from the accounts in the *Rocky Mountain News* of 1859, a larger quantity of farm products was produced on the Huerfano and brought to Denver by wagon trains than was produced in the vicinity of Denver and Golden. At the latter place the vegetable garden of Mr. D. K. Wall was noted far and wide for its productiveness. However, there had been such development on the Huer-

⁴ Mr. Head was a member of the October party; and by his ability shortly afterwards acquired a leadership in his county that he maintained for many years. Mr. A. A. Salazar of San Luis, who was familiar with the history of the valley from the time of his arrival in 1859 until his death in 1926, agreed with the opinion of Mr. V. Velasquez that Mr. Jacques, and not Mr. Head, was the original leader of the party who established the settlement at Guadalupe in 1854.

fano that Mr. W.N. Byers, in the course of an editorial article published in the *News* of April 25, 1860, wrote the following:

Monday 9th.—We took breakfast before leaving camp, and about sunrise set out up the valley of the Huerfano (Waer-fa-no). First we pass the ruins of J. B. Doyle's trading post; abandoned some years since. Next is the farm of Charley Autobee, and his village of retainers, Mexicans, Americans and Indians, occupying log cabins surrounding a plaza or open square. Near by is the garden cultivated last year by Wm. Kroenig, where from less than an acre of ground he obtained and shipped to the Denver market over twenty wagon loads of vegetables, besides home consumption. Next is the farm of Mr. Patterson—just commenced— and then comes the new farm of Mr. Kroenig. He is making extensive improvements and designs cultivating over one hundred and fifty acres. His acequia is already dug for the irrigation of the whole tract.

For a number of years beginning with 1860 the only large farms in Colorado were on the Huerfano, where large quantities of corn were grown. The *News* of July 22, 1861, mentioned that "Mr. J. B. Doyle on his farm on the Huerfano has over six hundred acres of corn, which is said to look as luxurious as you could see in Iowa or Illinois." In its issue of November 13, 1861, the same paper noted that Mr. Doyle was in the city, adding that "He has finished harvesting his immense crop."

The most available of the agricultural resources of Colorado in the early days was the annual crop of native grasses. While Lieutenant Abert was at Bent's Fort in 1846, in his diary for September 8th he noted that "Mr. Bent's people were cutting hay; they find that the wild grass of the bottoms, when well cured, makes excellent hay." This lesson was soon well learned; and the hay-making business became very profitable in later years, especially when travel to and from the mines was extensive. South Park was a great hay region. The natural meadows along the Arkansas, in the San Luis Valley, and in the valleys of the streams emptying into the South Platte north of Denver, produced great quantities of hay. A local advertisement in the *Rocky Mountain News* of May 15, 1861, announced for rent "the best ranche" in Colorado. This ranch was within six miles of Denver, and the advertise-



COLORADO FIELD CROPS

Upper, Dry Land Wheat; Middle, Hay Field; Lower, Potato Harvest

ment said that it would produce 100 tons of hay. In July, 1859, the *News* had an item entitled "Hay," under which heading the editor said: "We are glad to see stacks of hay going up in all directions. This is a good move, to prepare for wintering stock in due season." In November of the same year John D. Henderson advertised in the *News* that he had 180 tons of hay in stack on Henderson's Island, which was twelve miles down the Platte from Auraria and Denver.

As early as the spring of 1863 it had been noted in a newspaper review of agriculture in Colorado that the converting of the river bottoms into cultivated fields had gradually diminished the hay crop, and it was predicted that "it will very soon become necessary for our farmers to make 'hay-growing' a business." The *Black Hawk Mining Journal* of January 15, 1864, contained an item stating that "Yesterday a Ranchman sold a load of hay—6000 for 8 cts. per pound, \$480. At that rate the present winter will set the ranchmen on their pins for life."

The *Western Mountaineer*, published at Golden, reported the receipt by Mayor McCleary of "the pioneer mowing machine"—this in its issue of June 28, 1860. The same news item mentioned that Fox Diefendorfer had two machines of the same kind. "They are the first ones, we believe, that have been brought to this country, and will undoubtedly reap a rich harvest."

AGRICULTURE AND EARLY MINING

In what has heretofore been written it has been implied that the little agriculture that was attempted at Fort Lancaster, the "pueblo" on the Arkansas, at Bent's Fort, and a few other places was incidental to the main purposes of traders and trappers. It has appeared that the settlements near San Luis and Guadalupe were established strictly as farming ventures that turned out to be successful. The futile effort of the men who tried farming and stock raising at "Fort El Puebla" seems to have been made with a definite purpose to make a living by agriculture. The Mexican settlers in the San Luis Valley had the old idea that farming was a practically self-sufficing occupation: crops were grown to be consumed on the farms where they grew; live-

stock raised for essentially the same purpose. We are coming to a time and a situation when men raised crops and live stock to sell rather than for their own direct support. The men who went to the gold diggings had to be fed; and so there came an opportunity to farmers and to merchants to supply the needs of a considerable group of people and their work animals with food and with other necessities. Farming in Colorado thus began to be a business even before "Pike's Peak" had ceased to be the name of the region which now includes both Denver and Colorado Springs. D. K. Wall's garden at Golden was a business venture in 1859, just as William Kroenig's larger garden on the Huerfano was a business venture the same year.

Notwithstanding the fact that the soil and climate of Colorado had been proved suitable for growing vegetables and grains—and this as far back as the early '40s—the idea persisted for years that every attempt at farming in the vicinity of Denver, Golden, and Boulder was very much of an experiment. Thus the *Miner's Register* of Central City, in its issue of August 27, 1862, had the following: "It has been a well established fact, since the summer of 1860, that our valley ranches, with proper irrigation, will produce vegetables in fabulous quantities, but the profitable culture of corn, barley, wheat, rye, oats, and other grains has remained a matter of experiment, until the present season, which has fully attested the fact that all kinds of farming can be as profitably carried on in this country as in any other on God's green earth."

The same article stated that the season of 1862 had established "the further fact that our large upland population need not depend alone on the tillage of the valley lands for their supplies." The editor went on to say that "our broad mountain slopes and valleys, properly cultivated, will produce all kinds of vegetation in abundance." This was not an empty boast. Actual experience had already proved that vegetables and the hardier grains could be grown in the mountain valleys. Of course there were other reasons than a generous interest in profitable farming that induced the editors of the early days to encourage attempts at farming. Mr. Byers, of the *Rocky Mountain News*, although he had a genuine interest in agriculture and in the success

of farmers, was one of the most diligent of editors in searching for illustrations of profitable farming. Moreover, he was a successful farmer himself, and had fifty acres or more in cultivation in 1862. One of the "other reasons" alluded to in a preceding sentence was clearly stated by the *Miner's Register* of the date given above, and in the following words: "Agriculture and Horticulture should receive more attention throughout the Territory. It is of the utmost importance that supplies should be cheapened to our mining population, and that great want of the people can only be obtained by proper cultivation of the soil; then and not till then will the people of this country become absolutely independent."

Within a few years the farmers were able to supply the needs of the miners and others of the mountain towns and of Denver and other towns which depended in large part for their prosperity on the profitableness of mining and the continuous coming and going of people interested in prospecting and mining. So agriculture expanded. The great ox trains brought loads of vegetables from New Mexico and from Utah for a time, and later from the Huerfano and the valley of the Fountain. From the valleys of the Boulder, the St. Vrain, and the Big Thompson supplies were hauled to the mining towns and to Denver and Auraria. Indeed, there were times when the supply from the farms exceeded the effective demand. In May, 1863, the *Miner's Register* stated that thousands of bushels of potatoes were "rotting for the lack of purchasers and consumers." In his message to the Legislature of Colorado, delivered on July 18, 1862, Governor John Evans had spoken as follows:

As to the home supply of agricultural products, so important to the accumulation of permanent wealth and population, the crops now standing on the farms, in the valleys on the various branches of the South Platte, Arkansas, and Fontaine-qui-bouille afford most encouraging prospect. In the latter valley alone there will be produced, this year, according to careful estimates, 25,000 bushels of wheat, 40,000 bushels of corn, 20,000 bushels of potatoes, and other produce in proportion. The great profits of such crops and the exceeding productiveness of those lands lying along the streams, I have no doubt will soon induce an agricultural production that will abundantly supply the demand.

IRRIGATION: BEGINNINGS AND DEVELOPMENT

It is well known that irrigation was practiced in what is now Colorado long before the region was known to the hunters and trappers who frequented the mountain country in the first few decades after Pike's explorations in 1807. But the early irrigators, who left traces of their work before the American Indians occupied the territory, disappeared and left no history of their times. The Indians were a different sort of people, and there seems to be no trustworthy records that they irrigated or even cultivated crops in Colorado, unless it might have been small patches of corn and beans, and possibly melons. Our study of irrigation in Colorado must begin with the coming of the white man.

The earliest irrigators of whom we have sure records were the so-called Mexicans from the Territory of New Mexico; and what we know with certainty is in regard to irrigation practices in Southern Colorado, then a part of New Mexico. Many travelers through New Mexico commented on the skill of the native irrigators who occupied portions of the valley of the Rio Grande del Norte. From this valley came men who were descendants of generations of farmers who had practiced the art of irrigation; and these men were the teachers of the early Americans who came into an arid country from states and countries where irrigation was unknown. It is fair to guess that the abandoned ditch which Lieutenant Abert saw near Bent's Fort in the late summer of 1846 was dug by Mexican laborers. If there were irrigation ditches at Forts Lancaster (Lupton) and St. Vrain in the early '40s or before, we may be sure that laborers from New Mexico did most of the digging; for it is common knowledge that these men did most of the common labor around the trading-posts.

It seems certain that irrigation was practiced in a small way near Pueblo shortly after the settlement was made there in 1842; and it may be that crops were irrigated by the settlers who temporarily established themselves near the mouth of the Hardscrabble in 1843. John Hatcher, in the summer of 1846, opened a farm on the Purgatory, about eighteen miles below Trinidad. Here he had a ditch

more than a mile long, from which he watered his crop that season. He planted, cultivated, and irrigated; but the Indians convinced him that it was too dangerous to attempt to harvest what he had raised. So this promising irrigation-farming venture on the River of Lost Souls was given up, and Hatcher went elsewhere.

The first ditch of which we have official record was dug in the spring of 1852 by the settlers who came from New Mexico to the Culebra early that season. Knowing the need and the methods of irrigation, they proceeded to dig what is on record as the "San Luis Peoples Ditch," the decree of the court giving it a water-right out of the Culebra dating from April 10, 1852, the date the referee found that the work of digging began. So Priority No. 1 in District Twenty-four of Water Division Three belongs to a ditch dug by American "Mexicans" six years before the first gold discoveries were made in the vicinity of Denver. That same year another ditch was dug by these same Mexicans and their neighbors—San Pedro, with Priority No. 2. Priority No. 3 belongs to Acequia Madre, taken out of the Costilla about a mile south of the Colorado-New Mexico line, but with a Colorado decree of 19.5 cubic feet of water per second for use on 900 acres of land in Colorado. This ditch is on record as of 1853. It was on Costilla Creek, and doubtless within the present limits of Colorado, that Mr. G. H. Heap, on July 5, 1853, saw the "numerous farms" which he said were "skilfully irrigated" by the Mexicans. He said also that their crops, "consisting of wheat, corn, beans, and peas, gave promise of better results than those on the Culebra." Priority No. 13 of this district has the date May, 1858, all of the others being earlier.

On the other side of the Rio Grande was another settlement, begun in the fall of 1854, under the name of Guadalupe. It was fitting that the first ditch taken from the Conejos to water the lands of these people should have been called the Guadalupe, with Priority No. 1, in District No. 22 of Division No. 3. In this settlement there seems to have been more competent leadership than on the Culebra and Costilla; for by the first of September, 1858, twenty-six

ditches had been taken out by them for the irrigation of their lands and to furnish power for mills.

It is worthy of remark in passing that more than forty irrigation ditches in the San Luis Valley have decrees dating earlier than those of the oldest ditches in other parts of Colorado. The second settlement in that valley had made greater progress than the first, progress being measured by population, number of irrigation ditches, and other material standards.

The year 1859 marks another advance. In the spring of this year Alexander Hicklin tapped the Greenhorn to get water for three small ditches, with decrees having priorities 1, 2 and 3 in District 15 of Water Division No. 2. Here it is interesting to go back to 1853, when Lieutenant Beckwith rode into the "fine little valley of the Greenhorn," where he noted that the stream was "entirely diverted from its natural channel and employed in irrigating the lands of the six Mexican families who reside at and constitute the present population of the place." Did "Zan" Hicklin use the old acequias dug and used by the people who were irrigating on the Greenhorn in 1853? Possibly these venturesome settlers had been using the waters of the Greenhorn before the San Luis People's Ditch was begun in the spring of 1852. If so, they might have had the earliest Colorado priority—if only they had not given up their homes in fear of the Indians or for other reasons.

Other ditches than the ones just mentioned were dug and used in 1859. Some of them have no official recognition. D. K. Wall at Golden, and William Kroenig on the Huerfano, raised abundant crops of vegetables during that summer, marketing their surplus in Denver and the nearby towns. These men must have had irrigation ditches. Early the following year the "acequia" on Mr. Kroenig's "new farm" was mentioned in editorial correspondence⁵ in the *Rocky Mountain News*. Mr. Wall's ditch was also described in 1860. In Northern Colorado the ditches of 1859 which have recorded decrees are the Lower Boulder, from Boulder Creek, with Priority No. 1 in District No. 6 of the First Water Division, its decree dating from October 1st, and the Smith & Goss and the Howell ditches, with later dates of beginning; also the McBroom ditch from Bear Creek,

⁵ *Rocky Mountain News*, April 25, 1860.

with the earliest priority from that stream. In the San Luis Valley, the San Luis Mill Ditch, with a decree for "manufacturing and milling purposes," goes back to October 1, 1859, and has Priority No. 26 in District 24—the district of Water Division No. 3, which has the earliest judicially determined priority in Colorado.

We are now considering the period when energetic pioneers from Eastern states and from Europe were giving their attention to irrigation in an unfamiliar arid climate. The Mexican settlers were simple, industrious folk who did not think of irrigation in the expansive ways of their American neighbors in the northern part of the Territory of Colorado. There was one relatively large ditch in the San Luis Valley, Head's Mill and Irrigating Ditch, with a decree for more than a hundred cubic feet of water per second; but Head (a native of Missouri, who came to New Mexico with Colonel Price's army) was a man of large ideas and exceptional ability and energy, and so was enabled to acquire a leadership that was not matched in fifty years by the Mexicans, among whom he lived for many years. His ditch had Priority No. 2 in the district including the Conejos River, from which it drew its water for irrigation and for one of the early flouring mills of the San Luis Valley.

EARLY GRIST MILLS

The early ditches made possible successful wheat-raising in Colorado. Where wheat was grown in considerable quantities grist mills were needed. The first settlers from New Mexico were content to use the coarse unbolted meal ground in the mills made by their neighbors. Richardson mentions one of these mills which he saw on the Costilla in 1859. It seems certain that similar mills were in use on the Culebra at an earlier date—possibly as early as 1853 or 1854. In 1856 a mill was built near Guadalupe, its motive power being water from the Conejos River. The stones for this mill were made of the native lava of the region—a hard, porous stone which the natives called *mal pais*. It was very hard, and could be used without the systematic dressing necessary when the French burr-stones were used. It is not known how many of these

simple native mills were used within the limits of Colorado. They were soon succeeded by the "American" mills, with cleaning and bolting machinery. The first mill built in Boulder County is said to have used millstones cut from native rock.⁶

The first American mill was built at San Luis in the fall of 1859 by H. E. Easterday. Mention has been made of the ditch which supplied water power for this mill, its decree giving it the date of October 1, 1859. It can not be proved that this mill was in actual operation before the close of the year, though the statement of Mr. A. A. Salazar, who came to San Luis in December of that year, is very positive that it did. A letter from Mr. Easterday in the spring of 1860 was dated at "San Luis Mills," New Mexico; and in April of that year Mr. Easterday advertised in the *Rocky Mountain News* "a large and beautiful supply of American Mill Flour, made at our mill in New Mexico." In the *Rocky Mountain News* of September 6, 1861, it was reported under the heading, "The First Mill," that "a fine flouring mill arrived yesterday for J. B. Doyle & Co." This mill was to be shipped to the Huerfano "to grind the grain of the great farm of that firm." It was stated that custom work would be done when the mill was not otherwise occupied. The *Canon City Times* of November 10, 1860, mentioned two mills in operation—"one on the Huerfano, and the other on the Fontaine qui Bouille." It may be that the mill on the Huerfano was the one mentioned by the *News* of December 1, 1859, in an account of a shipment to a local merchant, including corn meal "ground at a new mill, recently erected by Wm. Kroenig, on Huerfano, about one hundred and fifty miles from this city."

⁶ In this connection it may also be stated that the first flouring mill in the county was started by Douty & Son, on South Boulder, in 1862, the proprietors having made the burrs from conglomerate rock found in the foothills.—E. H. N. Patterson, in *Georgetown Mining Review*, May, 1874.

An article in the *Daily News* of July 7, 1864, mentions the Douty mill as having been a convenience to the farmers of the surrounding valleys the previous season. It was swept away by the high water of the spring of 1864; but it was rebuilt in time to operate that fall. The *News* of October 21st mentions receiving "some of the finest flour" from Douty's "excellent mill on South Boulder."

The year 1862 witnessed the building of a number of American flouring mills in Colorado. J. W. Smith of Denver, who is said to have brought a small portable mill to Denver in 1860, built a steam mill in 1862, which did its first grinding on November 18th. A story in the *News* of November 27th mentioned that two sets of small "French Burrs" were set up and running. At this time Mr. E. T. Colton was building a mill on the Fountain at Colorado City. Whether it was completed in time to begin operating before the end of the year is not certain. Howbert mentions this mill as the first erected in Colorado City, stating also that the crops were large in 1862 and seeming to imply that Colton's mill was completed in time to grind the wheat raised that season. The *Denver Commonwealth* of September 25, 1862, reported this mill in course of construction, to be completed by the 15th of November. This was the year of the completion (according to Patterson) of Douty's mill on the South Boulder. In 1863 its operations were mentioned in Denver papers, with praise for the excellence of its flour. The next year a small water power mill was built by Mr. David Barnes on Bear Creek, which was moved the following season to Golden; and at Cucharas (now La Veta) J. M. Francisco and Henry Daigre put up a small mill, but without equipment for bolting the flour.⁷ In 1865 Colton & Whittemore built a mill in Denver, P. M. Housel one at Valmont, and the machinery was received for a mill at Golden; but this was not put into operation until the following year, when a second flouring mill was put up at that enterprising town. The first mill in Pueblo was built this year. Before the end of 1867 a third mill began grinding at Golden, three were in operation at Colorado City, the Rough and Ready Mill was beginning a flourishing career at Littleton, the Trinidad Mill was serving the people of the southern part of the territory, and Baxter & Creswell had their "large two-story

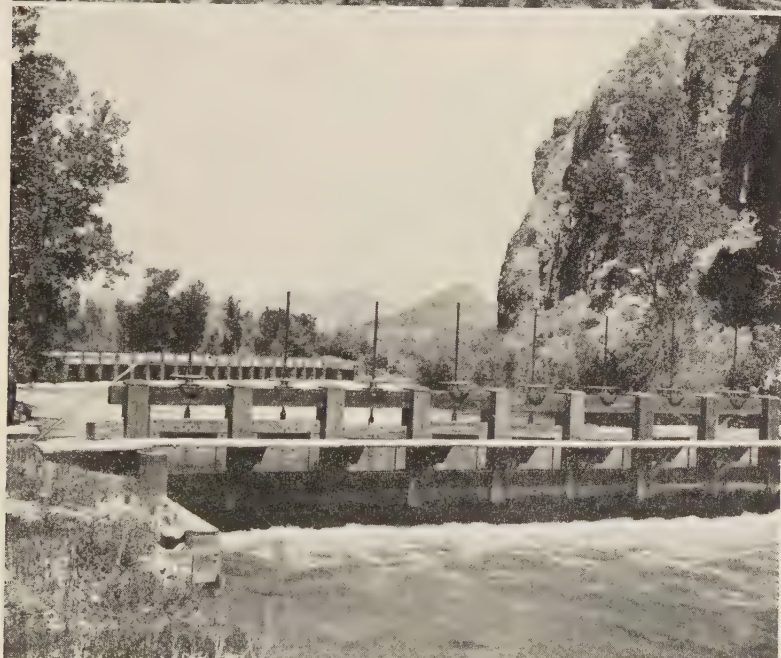
⁷ It is probable that this mill had burrs of native stone. On November 24, 1865, Mr. Daigre wrote to Colonel Francisco as follows: "I hope you will not dispose of your French Burrs before coming. I think it would be to our advantage to have our mill fixed here to make good Flour, which can be done with little expense." The silk bolting cloth bought for this mill was in possession of a sister-in-law of Francisco as late as October, 1924—and still unused.

flouring mill in active operation night and day," as a correspondent of the *News* put it in the daily edition of that paper of December 23, 1867. In 1868 other mills were built—one at Camp Collins (now Fort Collins), one at Nathrop, on Chalk Creek, and a few others. But mills were now becoming common. Indeed, in some parts of the territory, the business of flour milling was much less profitable than it had been.

To illustrate the statement just made, the following may be quoted from a correspondent of the *Denver Weekly Tribune*, who wrote from Colorado City, October 28, 1867: "I would not advise the building of any more *Grist Mills* at this place. They have three already completed and more prospective, all together—up in the very canon of the mountains. They must have had an idea that the rocks and mountains themselves would require grinding. The three mills, if properly distributed, would grind all the grain raised in the lower country for some years to come." One of these mills, according to an article by W. R. Thomas of the *News*, was built at a cost of \$18,000.

The *Colorado Business Directory and Annual Register* for 1876 listed twenty-six mills in the territory—five in Arapahoe County, eight in Boulder County, one each in El Paso and Fremont counties, three in Jefferson County, two in Larimer County, two in Las Animas County, one each in Pueblo and Saguache counties, and two in Weld County. At the same time Lafayette Head's mill must have been in operation at Conejos, the Easterday mill at San Luis, and a number of small mills in Huerfano County. Probably Nathrop's mill was also running, at least intermittently.

The period of extensive milling had not yet opened. When J. K. Mullen bought the Excelsior Mill from J. W. Smith in 1879, the man and the opportunity met. Mr. Mullen was a miller—and also a man of constructive imagination. He built up the business in Denver; and then he reached out for other mills, so that within a dozen or fifteen years his mills began to be called "the combination." The milling business has greatly changed; only a few of the old-fashioned burr-mills are left, and these few are idle or unprofitable. Two are known to the writer—



(Courtesy Denver Chamber of Commerce)

1. IRRIGATING AN ORCHARD IN MESA COUNTY
2. IRRIGATION CHECK ON RIO GRANDE RIVER IN
SAN LUIS VALLEY

Nathrop's mill on Chalk Creek, and the mill near Saguache, which did its first grinding on the evening of December 16, 1873, before it was finished, because the people were "so pushed for flour." Nathrop's old mill is still owned by a son of the builder, but the Saguache mill has changed ownership a number of times.

THE LARGE CANALS AND RESERVOIRS

The coming of the Greeley (Union) colonists had a most extraordinary influence on the agriculture of Colorado. The Union Colony, important as it was, was not the first agricultural colony, although it was the first that came with a definite plan written and published to all the world. Strictly, the groups that settled at San Luis and Guadalupe in 1852 and 1854 were agricultural colonies; and these colonists established the earliest irrigation systems in Colorado that remained, and remain to this day. Indeed, as this is written, one of the original members of the Guadalupe Colony is still living within a few miles of the original settlement. This man (Vicente Velasquez) and his wife were reported on September 29, 1926, to be in good health on the farm they have occupied and tilled for more than fifty years. But the people who organized and established the Union Colony were a select group, including many men who might be compared in ability with the one strong man who exercised leadership in the early days of the San Luis Valley colonies. To name such men as David Boyd, R. A. Cameron, J. Max Clark, B. S. LaGrange, N. C. Meeker, W. E. Pabor, J. C. Shattuck, and H. T. West is to list outstanding examples of a large number of men of ideas, education, experience, and energy. These and others were men of imagination coupled with the power to hold on and to turn their visions into realities. Meeker was the originator of the colony idea, and was vigorously and intelligently supported by Horace Greeley until the death of the latter; also, he was the editor for a number of years of the *Greeley Tribune*, founded in November, 1870, following the settlement by the first colonists in April of the same year. The *Tribune* became a power in Colorado and throughout the United States—in Colorado to set forth the ideas of the colonists; in the United States to advertise the colony

and the colonizing idea. It became also the best agricultural paper in the state, being decidedly superior to the weekly editions of the *Rocky Mountain News* and other Denver papers. This was due largely to the reports of discussions in the Farmers' Club, written by J. Max Clark, and to other writings by the same versatile farmer.

The first large irrigation canal in Colorado was dug by the Union Colony, and cost, including the enlargements made up to 1887, just under \$90,000. The following year it was transferred to the farmers under it, who incorporated under another name. However, to this day the original Colony ditch is known as Number Two. It was a pioneer of the larger type of irrigating canal; and soon there were other "big ditches" in several parts of the state. Number Two was not dug by practical irrigators, as were the pioneer ditches of the San Luis Valley and certain other parts of the Territory of Colorado, but by men who had nearly everything to learn. Happily, these men were willing and able to learn; and, with their visions and dreams, had the good sense and ability to transform their theories and book knowledge into workable experience. They were able to study reports of Italian and Utah experiences in irrigation and to adapt what they learned to their own conditions. The early files of the *Greeley Tribune* contain much discussion of irrigation and other agricultural problems—much of it intelligent and suggestive even today; some of it more or less fantastic; all of it indicative of active thinking and diligence in the work of solving the pressing problems of agriculture by irrigation in a new country.

While there were other agricultural colonies established in Colorado, all of them together do not seem to have had the influence on agriculture of Union Colony. They included men of ability and energy; but to a considerable degree they were followers or imitators of the Greeley idea, lacking the initiative and originality of the men who exercised genuine leadership at Greeley. Most of them contained too large a percentage of promoters as compared with real colonizers—men who believed in the colony idea as an aid in establishing productive farms in a new country; men who combined with a large faith the willingness

and the patience and the skill to work effectively under unfamiliar conditions; men who could learn from the experience of others as well as from their own; men who could think and write and speak, and so give to others the benefits of their own knowledge and thinking and experience. The Greeley men excelled in these respects, and so their influence went farther than that of equally good farmers elsewhere who lacked their special gifts as writers and speakers.

Mention has been made of the Union Colony Canal Number Two as the first large canal dug in Colorado. There were "large" canals of an earlier date—in the San Luis Valley, as has already been mentioned, and in Larimer County, where "Ditch No. 10" was constructed to take water from the Cache la Poudre on the north side of that stream at a point some miles west of Fort Collins. This canal has since been greatly enlarged and extended, and is now known as the Larimer & Weld Canal—one of the most important in Colorado. This great canal, with its system of reservoirs, ranks among the largest and best in Colorado. Another large canal in Northern Colorado—also getting its water from the Poudre—is that of the Water Supply & Storage Company. The name is suggestive of the fact that the irrigators of Larimer and Weld counties were the first in Colorado to realize to the full the need of supplementing canals with reservoirs. They not only realized the need of reservoirs, but acted accordingly; and so there was established in these counties a comprehensive system of reservoirs by the time the irrigators on the South Platte in the neighborhood of Denver had done little more than to begin to talk about the need of storing water. The well known Highline Canal, which taps the South Platte River at the mouth of Platte Canon, is a conspicuous example of a canal which might have been exceedingly valuable had its projectors foreseen the need of reservoirs and the wisdom of constructing them at an early date. Watering land in the immediate vicinity of Denver, this canal provides much less satisfactory water-rights than many later canals in the northern part of the state. When the period of reservoir construction really began in the region adjacent to Denver, it was too late to secure desirable reservoir rights, and so

a number of large reservoirs are now in use which can be filled only in seasons when the water supply is above the average.

In the Arkansas Valley several large canals have been constructed, one of the earliest being the Rocky Ford Canal. Much larger ones—the Amity Canal, the Lamar Canal, and the Bob Creek Canal, and others—have been built later. The promoters of these large irrigation enterprises had the advantage of the experience gained in Northern Colorado; and they were not slow to apply the teaching that reservoirs are a prime necessity in connection with large canals in Colorado. Limits of space will not allow the mention or discussion of the reservoir failures and successes in the Arkansas Valley; but it may be given as a general truth that the waters of the Arkansas drainage system are well conserved by the existing system of reservoirs. The valley is well adapted to irrigation by a system of canals and reservoirs, there being excellent natural reservoir sites both in the mountains and on the plains adjacent to the river.

The San Luis Valley has one large and excellent river for the supply of irrigation water—the Rio Grande del Norte. The water of this stream was little used by the early settlers of the valley, who supplied their ditches from the smaller streams—the San Luis, the Conejos, and others. So the great Rio Grande was reserved for the men with large ideas and large plans. Here we have a number of large and unique canals in that valley of exceptional interest. Canals running in a straight line as far as the eye can reach appeal to the imagination. They emphasize, also, the “levelness” of the broad floor of the valley, and at the same time create a difficult problem of drainage and other knotty problems for the resourceful people of the region. This valley has comparatively few reservoirs. The large canals of this portion of the state were relatively late in building—the first in the early '80s.

Over the range are the irrigating regions of the southwestern part of the state, in the wide vicinity of Durango; in the valley of the Uncompahgre, with Montrose as a center; on the Colorado River and its important tributaries, with Delta, Grand Junction, Glenwood Springs, and adjacent towns as place names to locate prominent centers of

activity; and finally, in the northwestern corner of the state are the smaller and, for the most part, later ditches that water the newer lands of Moffat, Routt, Jackson, Rio Blanco and Grand counties. Out of the Gunnison, through the tunnel of the first Colorado reclamation project, is drawn the water to supplement the somewhat erratic supply furnished by the Uncompahgre for the fine fruit country of that valley. Lower down, the Gunnison furnishes water for much good land in Delta County. The North Fork of the Gunnison and other streams supply additional land in this county. The Grand Valley of the Colorado, lying near Grand Junction, is supplied with most of its waters by the canal system of the Grand River Canal Company and the High Line Canal included in the Federal reclamation project. Other canals, large and small, higher up the Colorado and its tributaries, are well worthy of notice; but may not be mentioned for lack of space.

Colorado's irrigation system has been the greatest influence in the making of the Colorado of today. The mines represented the greatest industry and the greatest wealth in the early days; but mines "play out" while agriculture does not. Indeed, the farms are the permanent basis of the wealth and the enlarging prosperity of the state. Valleys and mountain slopes that were desolated by the exploitive methods of the miner are being restored and turned into permanent productivity by the activities of the farmer, the fruit grower, and the stock raiser. The storage and more effective use of water have enlarged the area of cultivable land in the state and have increased the gross product per acre; while improved methods have enabled the farmers to increase the value of every unit of their increasingly varied products.

THE STRUGGLE WITH NATURE

Much has been written of the successes of pioneer farmers. More has been published regarding the extraordinary prices received by some of the fortunate producers of the early days. It is true that in certain favorable years most of the early farmers received such prices for their grain and other crops that their net gains were well worthy of the publicity they received. One of the best of the "pros-

perity" stories of the middle '60s is that told of Peter Magnes, who came to the territory in his covered wagon with practically no wealth except that represented by "one yoke of oxen, six cows, and a wagon, with all his earthly possessions in the latter." This was written in the fall of 1865. Mr. Magnes had arrived in Colorado in the spring of 1860; and now, after five years of industry, in the language of the *News*, "he is able to live entirely at his ease, and is worth not less than twenty-five thousand dollars."

The wealth of Mr. Magnes at the time was largely represented by the land he had "claimed," the increase of his cattle, and a crop reported to be worth \$12,000—this in spite of the fact that it had been badly damaged by grasshoppers. It happened, however, that nearly all of the crops on the upper South Platte were seriously injured or destroyed by the grasshoppers. The *News* itself furnishes the other side of the story, if one looks for it. "It is generally conceded by Coloradans that but for the grasshopper plague the territory would this year have produced its own supply of breadstuffs, vegetables, and feed for stock. They destroyed the crop totally in many places and injured it in all. Yet there are some crops that will do to brag a little on, and the farmers who have them are far better off than if everybody realized good crops." So the successes of the two fortunate farmers were "played up"—the luckier one in detail; but hundreds whose crops were totally destroyed were not mentioned. Illustrative of the damage done by grasshoppers is the note in the *Rocky Mountain News* of June 15, 1865, that "Capt. D. H. Nichols is in town, enjoying a respite from the arduous labors of taking care of his extensive crop of—grasshoppers. Capt. says they have eaten everything up in Boulder County, and are now dying from starvation." This, too, was an over-statement: there was a scant crop, in spite of the insects; but the season was very discouraging.

But 1865 was not the first year of the grasshopper in Colorado. In the *Republican* of May 29, 1862, was the following: "One of the terrible plagues of Egypt now threatens Colorado. The grasshoppers are now making their appearance in innumerable numbers. Last year they were a source of great annoyance to our farmers, but this season

there are grounds for serious apprehension. * * * Several farmers have just given up all hope of agricultural success, and have turned their attention to other business. Some have stopped planting, hoeing, or cultivating, in hope of a favorable aspect in the future; while many not troubled with the plague, still work on in hopes, and plant such things as the insects won't eat." About two weeks later the same paper reported that the country had been favored with frequent rains and inferred that the rains had killed the insect crop in its infancy.

There was destruction by grasshoppers in 1864, as well as in 1865. Again in 1866 there were many complaints about the damage done by the millions of grasshoppers. Joseph Wolff wrote from Boulder on September 16th, saying that they "have continued assiduously at work," destroying vegetation and depositing eggs for the next season's brood. "I'll bet they have left four hundred bushels of eggs on twenty-five acres in my field." He intimated that he and others would beat the insects the following year by not planting crops. The *Rocky Mountain News* of September 14th stated that the grasshoppers had "gone earnestly to work, to eat up the remaining crops in this region of country. They are devouring corn, cabbage and most late vegetables, very rapidly. Fortunately, almost everything is out of their way, and the aggregate damage will be comparatively small." The *News* foresaw "great danger" that the next season's crop would be seriously threatened, as the insects had already begun depositing their eggs "all over the country."

When the summer of 1867 came, there came also the grasshoppers. The pest was reported in destructive numbers on the Huerfano, the Arkansas, Clear Creek and in Boulder County. A farmer from the Fountain Creek reported to the *Tribune* that the grasshoppers had done great damage on the Arkansas, so that the crop would be only about half of that of the previous year. This estimate was confirmed by Mr. L. F. Bartels of Denver, in the *News* of September 18th; but Mr. Bartels attributed the scant crop of small grains to rust. North of the St. Vrain there seems to have been little damage by the pest, as Mr. W. R. Thomas, in his report of the crops on the Cache la Poudre, makes

no mention of insect injury, and his statements of yields of small grains indicates a satisfactory average.

Another difficulty appeared in the '70s. The grasshoppers came again in countless numbers and caused much loss and suffering for several years. But wheat and other grains were not yielding well, even when there were no grasshoppers. The best farmers were getting poor returns from fields that had been yielding abundantly. What was the explanation? New lands seemed to be more productive than similar lands that had been cropped less than a dozen years. Was it to be the old story of the thin lands of Eastern and Southern states and of the once fat lands of Southern Illinois? The wisest were as much puzzled as those of least experience. Besides, there was the belief, which had been encouraged by Horace Greeley, that irrigated land "never wears out." The contrary was and remains true: irrigated land does "wear out" unless intelligently farmed.

While the wheat farmers were puzzled or distressed by the diminishing yields of their fields (and by lowering prices), a new candidate for agricultural favor was being introduced on a few farms. Alfalfa was beginning to be tried. A sketch of Maj. Jacob Downing, published in 1898, states that "In 1862 he introduced alfalfa into Colorado, bringing the seed from Old Mexico and planting it on his farm."⁸ Governor A. C. Hunt seems to have been one of the early experimenters with alfalfa. In a letter to the *Greeley Tribune* (written in November, 1870), Mr. Hunt made the following statement: "My first successful experiment was with a small piece of land measuring about $\frac{1}{8}$ of an acre, sown one-half with common red, and the other with Lucern or blue Mexican. This piece supplied almost the entire summer feed for two cows, during three summers being cut three and four times in one season." It is fair to assume that the "Lucern or blue Mexican" was alfalfa, which must have been sown in 1867. Mr. N. M. Henry of Niwot, Colorado, one of the early settlers of Boulder County, in a letter written in April, 1924, states

⁸ This sketch (Denver and Vicinity. Chapman Pub. Co. Page 1240) adds that Major Downing raised alfalfa "for years and used it for feed before others would consent to use it."

that Charles Baldwin moved from California to Colorado in 1868, and "brought some alfalfa seed with him," which he sowed on his horse ranch where the Stanley reservoir now stands. "I saw it in 1871, and it looked like it might have been growing for years." The late Senator G. W. Swink, writing to the author in 1901, stated that Mr. George Gilbert of Pueblo County had told him of planting alfalfa in 1868; also that the first raised in the vicinity of Rocky Ford was put in by himself in 1877, and not plowed up till 1900. But alfalfa made its way slowly. In February, 1873, a *News* report of the meeting of the Denver Farmers' Club stated that "A question was put as to the raising of alfalfa, and Mr. J. Y. Dillon said that he had at one time planted some on his ground, and never wanted any more there. His great trouble was to get rid of it. * * * He had no doubt that it would stand the drought better than any other species of grass. Its roots are long, and little or no moisture is required for its successful propagation. Other members who had experience regarding its culture thought it grew too large and was too harsh for stock. Unless cut when quite young and tender, it might be regarded as almost worthless for feeding purposes." With our present knowledge the reader of this may be pardoned for smiling at the unbelief of the Denver "farmers" of 1873. Even the *Greeley Tribune* in 1872 said that "alfalfa clover" was not much esteemed, adding: "It looks like a weed."

Alfalfa having finally made good as a forage crop in the opinion of Colorado farmers, it was soon to furnish the explanation for the failure of wheat to continue its abundant yields on the same land. When a few farmers had plowed up alfalfa fields and sown them to wheat and other cereals, the surprise came: alfalfa renewed the fertility of the soil. The explanation need not be gone into here. Suffice it to say that now it is common knowledge among

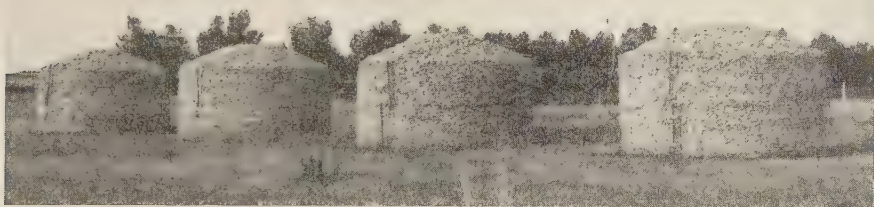
⁹ In April, 1874, the *Tribune* quoted the *Colorado Farmer* as follows: "L. K. Perrin, one of the best and safest experimenters in the Territory has an acre of alfalfa now starting into its fourth year. He told us, this week, that it had made a growth this spring of about five inches. * * * He says he sowed this too thin (only about eight pounds to the acre), but last year he cut it three times, getting each time about one ton."

farmers that alfalfa prepares the land for increased crops of wheat and other cereals, as well as for other crops. Good farming now presupposes the use of alfalfa in practically every system of rotation.

It was many years before the farmers of Colorado realized fully (if, indeed, all of them yet realize) that every new crop introduced into Colorado adds to the general wealth of the state. Potatoes were raised from the first, but it was not till the Greeley farmers had made a commercial success of potato-growing that the possibilities of the Irish potato began to be appreciated in the state.

AGRICULTURAL ORGANIZATION

Surprisingly early in the history of Colorado there were efforts to organize for the improvement and promotion of agriculture. Thus in its issue of July 13, 1861, the *Weekly Colorado Republican and Rocky Mountain Herald* contained a call for a convention to meet on July 31st to organize a society to "assist in the development of our Agricultural resources, and the discussion of useful information upon that subject." The call was signed by thirty-two prominent citizens of the territory, among them being Governor Gilpin, who had recently arrived to take up the duties of his office; A. G. Boone, a grandson of the famous Kentucky pioneer; Lafayette Head and Amos Steck, afterwards leaders in political affairs in Colorado; Thomas Gibson, the publisher of the one issue of the *Cherry Creek Pioneer*; Alexander Majors, and William Larimer, Jr. These men promised in the call to use their best endeavors to speed "the organization of an Agricultural Society and support the same." Apparently the great influence of these men was not sufficient to accomplish their purpose; for in the *News* of August 13, 1862, the same subject came up again in a prophetic letter from Robert Stubbs of South Park. Mr. Stubbs proposed the "formation of Agricultural Societies, and the holding of Agricultural Fairs." He even suggested a fair "to be holden in Denver in the latter part of September" and intimated that the presence of the members of the Legislature in Denver might furnish the occasion for bringing the matter to a head. The very next day the *Weekly Commonwealth and Republican* contained



COLORADO FIELD CROPS
Upper, Bean Field, Merino; Middle, Corn Cribs;
Lower, Onion Production

an editorial advocating the organization of farmers' clubs in the various counties of the territory. In the following October the editor of the *Commonwealth* recurred to the same subject, saying that "two years of experiment have taught our farmers many things; to each one something which the others have not learned." The point was well made that each farmer had something in his own experience to tell his neighbor, and that the neighbor also had something to tell; therefore it was obvious that there would be "a mutual benefit in getting together and 'swapping' experiences."

All of the recorded and unrecorded advocacy of organization for the improvement of agriculture failed of immediate results. However, after a preliminary meeting, on March 28, 1863, the Colorado Agricultural Society was organized and a constitution adopted. Capt. Richard Sopris was chosen president; Robert Stubbs, vice president; and William N. Byers, secretary. Commenting on the action taken, the *News* a few days later said: "We look upon this as one of the most important steps ever taken by our people." It was stated that at future meetings of the society subjects of interest to the members would be discussed; and the editor announced that in the future he would "devote some space" to the subject of agriculture, and at the same time solicited contributions for the proposed department. After choosing its officers, the Agricultural Society considered a proposal to hold a fair during the coming fall. Governor Evans urged that the society "take hold of the enterprise with a strong hand." The executive committee was then instructed to make preparations for holding the proposed fair. So great was the interest that the editor of the *News* concluded an editorial by saying: "It is earnestly hoped that every farmer from the Cache-a-la-Poudre to the Arkansas, who possibly can, will attend the next meeting and become members of the society."

The subsequent activities of the Agricultural Society and its legal successor were chiefly devoted to holding fairs and horse-racing meetings, to which reference will later be made. The idea of an agricultural society, in whose meetings agricultural subjects would be seriously considered by

experienced farmers and other competent persons, had not taken deep root in Colorado. Even before the Agricultural Society it had been editorially argued that the formation of county or district farmers' clubs would tend to unite the interests of the farmers, to stimulate ambition, and "to improve by a community of experience and knowledge the growth and importance of each farm." But men like Mr. Byers and others of the active promoters of the Agricultural Society and the general development of agriculture were more deeply interested in other subjects: they seemed to be genuinely interested in agriculture, but not for its own sake so much as because the general prosperity of the territory was believed to depend on the abundance of farm products. Although in February, 1868, the editor of the *Denver Tribune* had commented approvingly on a suggestion to organize a "society promotive of the *farming* interests of the Territory, somewhat on the plan of the New York Club," the idea did not find effective lodgment in the minds of active farmers.¹⁰ Not till the coming of the Union Colony in 1870 was there brought together a considerable group of men who actually felt the need of studying and discussing with other farmers the subjects really appropriate to a farmers' club—that is, the topics that grow out of the successes and defeats of men who are making a living by farming.

Late in the fall of 1870 the time arrived when a few members of the Union Colony found time to consider together their own experiences during their first season in Colorado; and in the *Greeley Tribune* of December 21, 1870, appeared a call to "all interested in the organization of a Farmers' Club," to meet in the Colony Hall on the evening of December 23d "for the purpose of initiating such organization." The call was signed by David Boyd and seven others. Captain Boyd was a trained man of strong purpose; and when the meeting was held, he was the inevitable man to be made president. J. Max Clark was chosen secre-

¹⁰ A farmers' convention held at Boulder, October 15, 1869, recommended the organization of one or more "farmers' clubs on each of the creeks throughout the farming portions of Colorado, for discussing all subjects in which agriculturalists, fruit and stock-growers are interested."

tary; and his skill as a writer added much to the success and influence of the club, which was named the "Colorado Farmers' Club," though always afterwards known by the name of the town where it originated. The *Greeley Tribune* carried regular first-page reports of the weekly meetings of the club, written by Mr. Clark, who was careful to report in sufficient detail what the various speakers actually said. These reports were widely read, and gave to the Colorado public much valuable information, together with a good deal of discussion that was theoretical about as often as it was practical. In January, 1873, the *Greeley Tribune*, in an editorial discussion of the club, said: "For two years has our Farmers' Club held regular sessions during the months not devoted to active outdoor work, and, for the most part, all of its meetings have been interesting. Being the first Farmers' Club organized in Colorado, it now has followers in almost every thickly settled farm region in the Territory, and it is not too much to say that we are favorably known at home and abroad." In the following April the *Tribune* quoted (doubtless with satisfaction) a sentence from the *Denver Times*, thus: "The *Greeley Tribune* can congratulate itself on one thing—that the Greeley Farmers' Club, which it did so much to foster, was the father of all the other clubs in Colorado." The first of these "other clubs" (the Clear Creek Valley Farmers' Club) was formed at Arvada, on January 4, 1872, at which time, according to the *Denver News*, "the people turned out *en masse* and welcomed the veteran agricultural writer, N. C. Meeker, who had been engaged to deliver an address at this first meeting." The address was published in full by the *News* and afterwards in Mr. Meeker's own paper, the *Greeley Tribune*. Ten or more of these clubs had been organized before the end of 1873, and all of them seem to have been useful in promoting knowledge of better methods of farming; but some of them discussed public or political questions.

With so many farmers meeting and talking in farmers' clubs, it was natural that some one should suggest federation—a club of clubs. The suggestion was made by the Clear Creek club at a meeting held at Arvada on October

10, 1872; and on November 20th the Greeley club received its invitation to appoint three delegates. Doubtless the other clubs received similar invitations. Apparently the date of the meeting was changed by common consent; for in its issue for April 9, 1873, the *Greeley Tribune* reported as a matter of news that "Delegates from the Farmers' Clubs of Colorado have organized the 'Colorado Farmers' Union,' with the following officers: President, Geo. F. Packard; vice president, R. S. Little; secretary, W. Holly; corresponding secretary, J. C. Febles; treasurer, Dr. J. H. Morrison." The new organization soon attracted attention. In its issue for August 13th, the *Greeley Tribune* stated that the agricultural societies of Colorado were in a flourishing condition, and quoted from the *Boulder News* an interview with President Packard. Answering the first question of the *News* editor, Mr. Packard stated that there were thirteen farmers' clubs, averaging about thirty members each. "Simply mutual benefit, protection and improvement," said Mr. Packard in answer to the question regarding the objects of the organization. He denied that the Union had any political significance, "so far as present parties are concerned"; that there were any professional politicians connected with the clubs. He affirmed that the irrigation question would be "thoroughly investigated and an effort made to secure direct aid from Congress"; and answered the last question by saying that farmers and ranchmen were too busy to attend to any business except their farm matters.

While the Farmers' Union was feeling its way, a new movement toward agricultural organization began to be noticed in Colorado; and President Packard of the Union was one of the first to recognize it. The first minute book of Ceres Grange No. 1 shows that George F. Packard was elected master in March, 1873, with a full set of associate officers. The next record is of an installation meeting held on August 31st, with the national grange deputy for Colorado present as installing officer. So rapidly did the grange influence penetrate the minds of Colorado farmers that when on October 11th the secretary of the Colorado Farmers' Union issued the official call for the annual meeting, he stated that representatives from "all regularly

organized Farmers' clubs, granges, and joint Farmers' and Stock-growers' clubs" would be entitled to seats. The convention met in Denver on the 20th of November, with fifteen organizations represented,¹¹ including six farmers' clubs, seven granges, one stock-growers' and farmers' club, and one citizens' association and board of trade. Evidently the convention was a stirring one. Two questions were considered as of primary importance—one growing out of a memorial recently adopted at Denver by what was known as the Trans-Missouri Irrigation Convention; the other the problem of regulating the prices of farm produce. The committee appointed to consider the latter question submitted resolutions reciting "That farming is not now a paying business; * * * that the usual remedies suggested for improving the farmers' condition—such as improved or varied culture, or the breaking up of the trust system—do not reach the difficulty, because their adoption implies a surplus capital in the hands of farmers, which does not exist; that it must be by an increased price and ready sale of farm products that farmers are to be benefited; * * * that in our present situation we see no ray of hope but in the organization of the Patrons of Husbandry." Mr. J. Max Clark strongly and effectively opposed endorsing the memorial prepared by the Irrigation Congress, and was supported almost unanimously. The *Denver Tribune* praised the farmers for outwitting the politicians. During the following weeks there was much discussion, particularly in the Denver papers, of the action of the farmers, who were stoutly defended by the *Greeley Tribune* and its most prolific local correspondent, Mr. J. Max Clark.

The new movement referred to above was the Granger movement, which was so effectively advocated in Colorado Territory that soon there were several times as many local granges as there had been farmers' clubs. While the Farmers' Union Convention was advocating the grange as the only hope for farmers, it decided to maintain its own organization, because, according to the *Greeley Tribune*, "the granger societies will be more specific and initiatory, but cannot be political," adding that "the Farmers' Union may, or may not, be so." It does not appear, however, that

¹¹ *Greeley Tribune* report, probably written by J. Max Clark.

the union survived. Early in 1874, enough local grange organizations had been formed to warrant a territorial grange; and on January 27th the organization was perfected at Denver under the leadership of National Deputy J. L. Brown. The new organization was formally christened "The State Grange of Colorado." R. Q. Tenney of Fort Collins was elected master, and P. M. Hinman of Niwot, secretary. A full set of officers was elected, as prescribed by the National Grange. On the third day of this special meeting the grange fixed the 24th of February as the date for a special meeting at Boulder to install the officers and transact other business; and then adjourned to meet as indicated—and every year thereafter until now—and doubtless for many years to come. For the Grange has proved itself to be an organization with a will to live and an object to work for.

At the time of the organization of the State Grange of Colorado there were forty-four subordinate granges in the territory, forty-two of which were represented at the first meeting. At the Boulder session only thirty-two were represented. From then until now the number of members and organizations has varied greatly, the largest membership being reported as of December 31, 1916, when the total was 9,029. During its long career the State Grange has had at its head only six different men—R. Q. Tenney, J. E. Washburn, Levi Booth, D. W. Working, J. A. Newcomb, and John Morris, who has served longer than any of his predecessors.

A number of other national farm organizations have been represented by state organizations in Colorado—among them the Farmers' Alliance, which was practically submerged in the People's Party movement of the early '90s, and thereafter disappeared as a force in the agricultural activities of the state. Later came the Farmers' Union, which has been an aggressive force in the state most of the time since its organization in November, 1906, and which now rivals the Grange in membership and influence.

Both the Grange and the Farmers' Union, in addition to being fraternal and educational organizations with secret rituals, have been deliberately educational and coöperative. Each has promoted and continues to support mutual fire

and hail insurance companies and other business enterprises, not all of which have been successful. The Union has to its credit a number of successful elevators; and it may be said with confidence that the present coöperative organizations of Colorado owe much to the incentive and work of the Grange and the Farmers' Union.

STATE EFFORTS TO PROMOTE AGRICULTURE

It is an old idea that agriculture should be promoted by the state. Colorado began early to recognize the principle that has since been accepted as fundamental—that one of the first duties of organized government is to encourage and protect the agricultural industry. The first Territorial Legislature of Colorado passed an "Act to Protect and Regulate the Irrigation of Lands," specifically granting to the farmer the right to construct and maintain irrigation ditches through lands between his own farm and the source from which it was necessary to draw water. This act was approved November 5, 1861. On the following day the governor approved an "Act Concerning Licenses," which provided that the requirement to pay a license for the privilege of selling "any goods, wares or merchandise" should not apply to persons selling commodities "raised by themselves in this Territory." Another act, approved November 6th, provided that it should be unlawful for any person not a resident of the territory to import into the counties of Costilla and Guadalupe¹² "any horses, cattle, sheep, jacks, jennets, goats or hogs * * * for the purpose of grazing, herding and feeding the same, or quartering them upon the public domain, or on the lands of any other person or persons."

The early history of the Colorado Agricultural Society has already been briefly recounted. The act of incorporation provided for an annual report to the president of the council—such report to include "a statement of its proceedings, embracing its incomes and expenditures, also specifying the nature of encouragement proposed by it, and the object for which, and the persons to whom premiums

¹² The day after the approval of this Act, another Act was approved changing the name Guadalupe to Conejos—and the latter remains.

have been awarded; also such details of the mode of cultivation, and of raising and keeping stock, and other items as will acquaint farmers and others, with the precise manner in which the valuable results were obtained." Section 7 of the act appropriated \$500, to "be used only for the purpose of paying premiums"; and Section 8 provided that no officer of the society should receive pay for services. Six years later an amendment provided that the secretary "shall receive such compensation as may be fixed hereafter at the regular annual meeting of the society"—but limiting the amount to \$200.

The Agricultural Society held its first annual fair in the fall of 1866.¹³ The officers had encountered many difficulties in making the necessary preparations. The *News* of July 3d announced that workmen were busily engaged in putting the grounds in order. "The ground selected lies east of the town, adjoining the race track. Forty acres are being enclosed in an eight foot 'grout' wall, within which the necessary buildings and stalls are to be erected." The proposed buildings, it was predicted, would be an honor to Colorado. The society issued bonds to the amount of \$10,000 to provide funds for putting up buildings, but found great difficulty in disposing of them. There was real opposition from the doubters and those who professed to believe that the purpose was personal gain for the officers. The forty-acre tract cost \$1,200, and when the contract had been let for half of the wall, the total cost of the enclosure was estimated to be \$4,700. The bonds were finally disposed of, and the fair was announced for September 20th and the two following days.

On September 17th the *News* announced that "Grand and final preparations for the first annual meeting of the Colorado Agricultural Society are being made. The grounds

¹³ The *Rocky Mountain News* of July 8, 1861, contained the following: "We have received a notice for publication, of an Agricultural Fair, which it is proposed to hold about the last of this month. It is to be hoped that all who feel an interest in the development of this region—and who does not—will give this subject more than ordinary attention and encouragement." Apparently no interest was aroused, as no further mention of the Fair could be found in the *News*.

are now in complete order." Two days later: "As we write this morning, it is snowing fast and furiously." The driving snow and the falling temperature seemed to indicate that the weather was "decidedly out of joint, just on the eve of the Fair, too"—a theme "too diabolical to dwell upon." But on the 20th: "The first day of the fair opens gloriously." In spite of the fine clear-up after the storm, the preparation of exhibits was delayed, and so the fair was ordered continued two days the next week. Nevertheless, it was not a success, either financially or as an exposition of agricultural and mineral products.

After the third annual fair sponsored by the Agricultural Society, the *News* of October 7, 1868, came out with a frank and rather gloomy editorial discussion of the fair of that and the previous years, saying that "they have been so far only reasonably successful in the matter of receipts; as exhibitions of the stock, farm, and garden products, mineral resources, domestic and other manufactures, it must in truth be said that they have been failures, or else that we have nothing of the kind worthy of exhibition. There has usually been a beggarly collection of ordinary stock of various kinds, a wagon load or so of big vegetables, a few samples of grain, fruit, bread, butter, preserves, etc., some trifling articles of manufacture, a gold bar or two, and insignificant specimens of ores. Denver has had the whole thing to carry on her shoulders. Scarce a farmer living more than twenty miles from town, has ever paid the least attention to these fairs." There was more of the same kind of criticism—and doubtless most of it justified by the facts.

Agricultural exhibitions in a new country have never been noted for completeness or for the general excellence of the articles exhibited. "Big vegetables" rather than excellent vegetables are the kind that received most frequent notice in the Denver papers in the early days. It need not have been wondered at that farmers brought big potatoes instead of well-selected and carefully graded potatoes. Even now, with the state fifty years old as a state, not all of the exhibitors at the county and state fairs have learned to exhibit the excellent products that show at once the agricultural possibilities of the country and the

farming skill of the grower, to say nothing of the trained discrimination that results from years of experience in preparing exhibits. The fairs of the old Colorado Agricultural Society, and its successor, the Colorado Industrial Association, really had much influence in promoting agriculture and stock-growing. In 1870 Dr. W. A. Bell and H. C. Childs brought to the fair from the southern side of the Divide a number of excellent purebred animals—Shorthorn cattle, and Cotswold and Southdown sheep. Curiously enough, Mr. Childs received an award of \$10 for a Durham bull three years old, and for an imported yearling bull Doctor Bell received a prize of \$8. For trotting and racing horses there were three prizes of \$100 each, and a number ranging from \$25 to \$75. The men named and a few other exhibitors were real breeders, and might well have received recognition comparable with that given to the owners of scrub trotters and pacers.

Mention has been made of the Colorado Industrial Association as the successor of the Agricultural Society. The new organization was the old one revamped. It seemed that Denver could not enlist the support of the state; and the fair could not be a state fair without support from outside counties. The *Pueblo Chieftain* in November, 1869, while admitting that the territorial fairs held at Denver, and the efforts of the society in the northern part of Colorado, had been productive of much good, still argued that a society in the Platte Valley, whose exhibitions are held in Denver, "never has been and never can be *Territorial*." It was in 1869 that the Boulder County Agricultural Society held its first fair. The society advocated by the *Pueblo Chieftain* came into being in 1870; and so, in the fall of 1873, there were announcements of three Colorado fairs—the first of the Colorado Industrial Association, at Denver; the second of the Southern Colorado Industrial Association, at Pueblo; and the third of the Boulder County Society, at Boulder. The Boulder County Society was prosperous for many years; that of Southern Colorado became the association which has been conducting the state fair at Pueblo so successfully for many years and until the good year of 1926; but the Denver association passed into his-



1. PACKING THE FAMOUS ROCKY FORD CANTALOUPES AT LA JUNTA
2. THRESHING WHEAT AT LAS ANIMAS

tory many years ago, its most lasting memorial being Exposition Street, which runs by the site of the "everlasting" grout wall built in 1866 to securely enclose the precious exhibits of the first Colorado fair.

The time came when the Territorial Legislature of Colorado recognized that something more than an Agricultural Society supported by its appropriation of \$500 a year was needed to give the necessary impetus to the agriculture of the Territory. So there was passed "An Act for the Establishment and Location of an Agricultural College," to be located "at or near Fort Collins." This act named trustees for the proposed college, giving this body appropriate powers, but no money to buy land or for any other purpose. Two years later, by amendment of the Act of 1870, the Legislature appointed a new board of trustees. In 1874, a third act (approved February 13th) appropriated a thousand dollars "to aid in erecting buildings" for the agricultural college and for other improvements, this money not to be available until the board should have raised and expended an equal sum. This gave the trustees something definite to work for; so that a tract of land was secured and fenced, trees planted, and a small building put up. Then, by an act approved February 27, 1877, the Legislature created the State Board of Agriculture, setting forth its powers and duties in great detail, and making it the governing body of the agricultural college. This board has been continued to this day, although some additional duties have been assigned to it by subsequent legislation.

The slowness of development of institutions may be well illustrated in the case of the Agricultural College by the report of the Committee on Education of the National Grange submitted in the fall of 1877. The report was doubtless written by Mrs. J. E. Washburn, wife of the master of Colorado State Grange, who was chairman of the committee. The particular part of the report which is of interest here runs thus:

Agricultural education in Colorado has not yet been commenced. The donation of lands for the support of the Agricultural and Mechanical College is not at present available, nor has there been any considerable amount appro-

priated for the erection of college-buildings. The legislature at its last session created a State Board of Agriculture, composed of eight members, seven of whom are active members of our Order, whose especial duty is to take charge of our Agricultural College. The farm and college-grounds, located at Fort Collins, have been enclosed, by a substantial fence, and one small brick building erected thereon. There has been an attempt made to divert the fund from an agricultural to a mining school, but it is confidently believed that the farmers will be able to carry out the original intention, and establish a school in which the sons and daughters of farmers may be educated in the science of farming.

In passing, it seems worthy of note that Mrs. Washburn herself was a student at the Agricultural College some years later, and that her interest in the college continues through her grandchildren.

The State Board of Agriculture, especially through the State Agricultural College and the Agricultural Experiment Station, has exercised great influence in Colorado. Later, through the Agricultural Extension Service and a number of administrative duties laid upon it or college departments, its power for service to agriculture has been largely increased. However, early in its history it surrendered certain of its functions as a Board of Agriculture. Some of these were later given to a State Board of Horticulture and other boards and commissions, with executive offices at the State Capitol.

At the present time, through its direct and systematic teaching within the college walls at Fort Collins and the Agricultural School at Fort Lewis, the Agricultural College serves to give sound education to all students who register for regular instruction—and are willing to work toward knowledge and understanding. By means of the Agricultural Experiment Station, with Federal endowment and state support, fundamental studies of agricultural problems are carried forward greatly to the advantage of the agriculture of the state. The Agricultural Extension Service of the college is comparatively new; but it has already served the state effectively, and is in position to carry to the “last man on the farm” who is open-minded to receive instruction much of the benefit which science is able to con-

tribute to the art of agriculture.¹⁴ So the college is finally in position to do the work foreseen by Senator Justin S. Morrill and Abraham Lincoln while the country was still in the throes of Civil War.

THE PRINCIPAL FIELD CROPS

Our knowledge of the crops of Colorado in the '60s and '70s is limited and inexact; but for the year 1868 we have some definite knowledge—thanks to a solitary horseman who rode up and down the valleys of the Platte and its branches above Denver; over the Divide and down the Fountain to Pueblo; thence up and down the Arkansas and its branches to Canon City and to Fort Lyon; on the Huerfano and other streams, and back to Denver. This horse-

¹⁴ Two Colorado counties have been represented as the first to support a county agricultural agent; and for two different men has been claimed the distinction of being the first in this interesting field of activity. The writer represented the United States Department of Agriculture at the time the preliminary and final arrangements with both counties were made, and nominated both men for appointment, and so is able to state the facts. The first county to become interested in and to provide for the employment of a county agriculturist was El Paso; and the first man to be selected and appointed was Mr. W. H. Lauck, who began his work in El Paso County on October 16, 1912. The second county to arrange for the work was Logan; and the second man appointed was Mr. D. C. Bascom, who began work under his new appointment on October 1, 1912. At the time of his appointment, Mr. Lauck was so engaged that he could not begin at once on his new job. Mr. Bascom was instructor in agriculture in the Logan County Industrial High School at the time he was appointed, and by agreement began work on a half-time basis as soon as his Federal appointment was effective. At the time of their appointment, it was understood that both of these men were to be joint representatives of the United States Department of Agriculture and the Colorado Agricultural College; but during the year 1912 their financial support came entirely from the Department of Agriculture and the counties interested. In El Paso the funds were provided by the county and by the Colorado Springs Chamber of Commerce; in Logan the county and the county high school paid the bills. The Department of Agriculture paid its share in the form of a contribution to the salary of each man. The third man was appointed for the San Luis Valley counties, and the fourth for Pueblo County.—D. W. W.

man went out to visit the farms and to learn what crops had been planted and the acreage of each; and he told the story of his fifteen hundred miles of travel in a valuable series of letters to the *Rocky Mountain News*. Those letters give facts—names of farmers, the acres each had in corn and wheat and other crops. For example, as he rode up Cherry Creek on the last day of May, he learned that A. H. Miles had 60 acres in corn, 50 in potatoes, 5 in strawberries, 2 in Mexican onions, 3 in melons, 1 in beans, 4 in garden, “and 500 asparagus roots.” From the Huerfano he reported that William Craig had 700 acres in corn, 400 in wheat, 100 in oats, 200 in beans, 40 in garden—1,440 acres in crops on one farm. There were other big farms on the Huerfano, which valley the horseman described as having “ever been famous for the extent of its farms, the productiveness of its soil, and the wealth and hospitality of its inhabitants.” The Doyle estate had over a thousand acres in crops, including 500 acres of corn, 400 acres of wheat, and 25 acres of garden. Out of a total acreage of 288, B. B. Fields had 130 acres in corn, 110 in wheat, and 25 acres in beans. And some there be who, knowing not of Craig and Fields and other Huerfano Valley farmers, think that beans are a recent introduction into Colorado.

The “solitary horseman” who rode through the valleys south of Denver in the spring of 1868, in the fall of that year rode his “Pet” down the Platte to the mouth of the Cache la Poudre and up that fine stream to Laporte, Greeley at the time being unknown and our present Fort Collins being known as Camp Collins. On this trip the horseman-journalist asked the farmers for acreage and yields; and so his letters have particular value to the student of the early agriculture of Colorado. Who was the horseman? At the time he was associate editor of the *Rocky Mountain News*, and at one time or another he served that paper in every editorial capacity from reporter to editorial writer and managing editor. In his later life he was best known as Dr. W. R. Thomas, professor of constitutional and irrigation history in the Colorado State Agricultural College.

After each name in his list, Mr. Thomas gave the number of acres in each kind of crop, as already indicated; and

at the end of each letter, or other appropriate place, he gave totals for each valley. The first letter of the series listed the farmers on the Platte River from the mouth of Plum Creek to a point near Denver—fifty-five in all. Totalling his figures, he showed 2,977½ acres “under actual cultivation” in the valley, divided as follows: Wheat, 1,241½ acres; oats, 593½; corn, 395; barley, 180; rye, 26; potatoes, 307; garden, 234½. Mr. Thomas explained that he missed two farms, and so he ventured the statement that there was a total of “above three thousand acres” in crops in the region over which he had ridden.

On Bear Creek, the horseback investigator found nineteen farms, having a total of 520 acres of wheat, 282 of oats, 79 of barley, and other grains; potatoes and garden to the amount of 174—the grand total being 1,055. Here again there were a few farms missed, said to have 169 acres in crops, swelling the final total to 1,224 acres.

Cherry Creek Valley afforded the names of twenty-one farmers between Denver and Spring Valley, all of these living near the road. On these twenty-one farms were found crops as follows: Wheat, 88 acres; oats, 185; potatoes, 186; corn, 78; barley, 32½; miscellaneous crops and garden, 237—a total of 804 acres, as printed in the *News* (with an error).

On the Fountain and its branches were found eighty-six farmers. The total for the valley was said to be “not a little surprising”—6,184½ acres, apportioned as follows: Corn, 2,870 acres; wheat, 1,555½ acres; oats, 1,158; unclassified grain, 414; potatoes and miscellaneous crops and garden, 88½; barley, 59; buckwheat, 39.

Then came the valley of the Huerfano, already mentioned incidentally. Here only eleven farms were listed, with 2,950 acres in corn, 1,160 in wheat, 232 in oats, 401 in beans, and 145 in garden and miscellaneous crops—a total of 4,888 acres, or more than 444 acres per farm. The Cucharas, a branch of the Huerfano, was missed; and in a July number of the *News* was given an account of the large farm belonging to J. M. Francisco and Henry Daigre, where 735 acres were in cultivation—500 in wheat, 200 in oats, 25 in corn, and 10 in beans. Other farms on this stream had crops having a total area of about 1,500 acres.

Down the Arkansas on the north side the horseman rode thirty miles, to the end of the settlements, and found twenty-nine farms having a total of 3,077½ acres in crops, apportioned thus: Corn, 1,575; wheat, 911; oats, 265½; grain, undivided, 282; garden and miscellaneous, 43.

Nine farmers were visited and listed on the St. Charles, whose total acreage in crops was: Corn, 742 acres; wheat, 485; oats, 135; miscellaneous, 87—a total of 1,449. Besides, four or five ranches were not visited; and so the acreage in cultivation on the St. Charles was estimated to be from 1,600 to 2,000.

Up the Arkansas on the north side, the horseman found thirty-nine farms; nine on Beaver Creek; nine on Four Mile; seven on the Hardscrabble; and three on Currant Creek. The crop acreage on these sixty-odd farms was reported as follows: Corn, 1,219 acres; wheat, 874; oats, 118; undivided grain, 536; garden and unlisted crops, 55—the whole totalling 2,802 acres for the valleys named. Later it was learned that three ranches, with 750 acres in crops, had been omitted. Zan Hicklin lived on the Greenhorn, where he had 175 acres in corn, 75 in wheat, 75 in oats, 40 in beans, and 15 in buckwheat.

A reporter for the *Golden Transcript* traveled down Clear Creek from Golden on the south side of Clear Creek, about eight miles; thence back on the north side. Thirty-two farms were listed, and the total area in crops was given as "over 2,100 acres."

When Mr. Thomas had completed the circuit of the southern agricultural valleys, he went to the mountains to write a series of articles on the mining industry. "Among the Farmers" was the general title of his agricultural articles. His first report of his observations "among the miners" was written from Fair Play, July 29, 1868. To reach that place he had ridden up Turkey Creek and across the Platte and on up over Kenosha Hill into what he called "this magnificent Park." Did he overlook the farms while in search of the story of gold and gold-seekers? "All along the valley through which the road passes," he wrote, "and especially after reaching the Platte at Bailey's, I noticed more or less farming. Oats, barley, potatoes, and all kinds of garden vegetables thrive finely. Mr. Slaght has seventy

acres under cultivation, and informs me that oats and barley will yield from thirty to thirty-five bushels to the acre. Last year he raised one hundred and fifty bushels to the acre. * * * Here in the Park, about ten miles from Fair Play, Mr. Guiraud has between forty and forty-five acres under cultivation, in wheat, oats, rye, potatoes and vegetables. He has raised forty bushels of rye to the acre, and that year one-fourth of an acre yielded between ninety-six and one hundred bushels of potatoes. All this the reader must remember is within a few miles of the great snowy range." Today, mountain farming is well enough known; then the successes mentioned were quite worthy of remark.

A letter dated at Laporte, November 18, 1868, has more than ordinary interest:

In the merry month of May the writer rode up the Platte, to see and write of its progress and development. In the chilly month of November he rides down the Platte on a similar errand. As the directions are opposite, so are the scenes which have met the writer "on the wing." The contrast could not be greater. As we passed up the valley of the great river, the farmers were in the midst of the planting season: the trees were budding, the grass green, and fields of growing grain were waving their welcome to the coming month of June. In man and nature all was life and activity, hope and promise. As we rode down the valley the cheerless but beautiful snow clothed the plains and mountains in its spotless mantle; all nature was dead, and the stacks of hay and straw, and the well filled garner told too well that the harvest had been passed. But whether the plains are green or white, the weather warm or cold, the planting season begun or ended, in fact whether we go up the Platte or down the Platte, or up the Cache a la Poudre, it is always pleasant to be "among the farmers" of Colorado. If the present month is less inviting out of doors than May, it is even more inviting indoors. The welcome to their homes, always kind and cordial, is now more appreciated, as cold and stiff you pass from the frosty air of evening to a cosy seat beside the blazing fireplace.

While the foregoing paragraph of Mr. Thomas's letter to the *News* contains little agricultural information, and the remainder of it but little more, it suggests to the eye of the mind a picture of the early days that ought not to

be missed. Another letter of the same date described the farms of the beautiful Cache la Poudre and listed thirty-seven farmers. B. H. Eaton (afterwards Governor Eaton) had 70 acres of wheat, yielding 1,000 bushels; also 700 bushels of oats and 500 of potatoes. The totals reported were: Oats, 24,762 bushels; wheat, 5,258; corn, 2,125; barley, 238; potatoes, 5,142; beans, 75. The hay crop of the valley was put at 1,390 tons. Mr. Thomas stated that the valley "does not contain less than 200,000 acres of land which can be readily irrigated and cultivated," and estimated that about one-fifth of that total was then being farmed.

On the "quiet, pleasant valley" of the Big Thompson the early agricultural census-taker found forty-five farms, a number of them owned in partnership. The totals of the crops reported were as follows: Potatoes, 32,375 bushels; oats, 27,078; wheat, 8,205½; corn, 3,297; barley, 363; acres cultivated, 1,715¼. Hay had been put up to the amount of 1,375 tons, 200 tons of it by the Brush Brothers, who had nearly 800 head of cattle and between 100 and 200 head of horses and colts. Mr. J. J. Ryan had made 7,500 pounds of cheese from thirty-five cows. Namaqua was the name of the postoffice at the upper crossing of the Big Thompson, and Big Thompson that of the office at the lower crossing. Here was the St. Louis Mill, of two run of burrs, owned by Mr. Douty, who had built the first mill in Boulder County six or seven years earlier.

The final story of this northern trip of Mr. Thomas told the story of the Platte Valley from Denver to the mouth of the Cache la Poudre. Latham was then the stage station at the juncture of the Platte and the Poudre, this being before Evans and Greeley were in existence—and a famous old place it was, both before and after it was known as Cherokee City. "From Denver to the mouth of the Cache la Poudre, the distance is about sixty miles. The valley averages probably three miles in width, but as yet only a small portion of the arable land is in cultivation." So wrote Mr. Thomas on November 25, 1868; and he noted that most of the farming was done within twenty miles of Denver, and that beyond, the agricultural productions were almost entirely hay, butter and cheese. He listed eighty-

nine farmers, and reported their crops in detail. The totals were: Corn, 3,012½ bushels; wheat, 12,081½; oats, 24,211; barley, 3,217; rye and buckwheat, 113; oats and barley (undivided), 10,965; potatoes, 6,875 bushels; tons of hay cut, 1,385; pounds of butter, 22,652.

The reader will have noted that these letters have said nothing of the agriculture in the San Luis Valley, in the Las Animas Valley, near Trinidad, nor in the Upper Arkansas, above where Salida now stands, in all of which regions there was an appreciable amount of farming. Indeed, in one of his "Among the Miners" letters, the writer mentioned the flouring mill under construction on Chalk Creek, near the present town of Nathrop. Nor was there anything said about the agriculture of Boulder County, which was very considerable at this time. So, although these paragraphs have attempted to indicate the extent of the agriculture of Colorado in 1868, it is to be understood that the writer is not attempting to give a statistical estimate, but rather to furnish a basis upon which every reader may form his own opinion. He who will ride through any of the fat valleys mentioned in this chapter and compare the present number of farms with the few actually listed and counted in 1868, will readily appreciate that the agriculture of the late '60s was a scattered pioneer effort at farming, while that of this good year of 1926, when Colorado is fifty years old as a state, is compact, well organized, and probably a hundred times as productive of a total of much more varied crops than were produced when the territory had been organized less than ten years.

The foregoing discussion has mentioned the principal crops which were grown in Colorado in 1868, nearly all of which are now grown in much greater abundance. But little winter wheat was grown then; now about four-fifths of the total wheat acreage is of winter wheat, as may be seen by consulting the table at the end of this chapter. Most of it is grown in territory not farmed in 1868. Corn has become the greatest cereal crop of the state when measured by number of acres and total yield in bushels. Oats, barley and rye continue to be staple cereal crops; and of course the total production of these cereals has greatly increased.

Forage and pasture crops have greatly changed in importance. The early farmers made their hay from the natural meadows along the streams. Later the clovers and timothy were tried with a considerable measure of success. For a time red clover gave promise of being the most important hay crop; but alfalfa, having proved so much better adapted to Colorado conditions, once it became well established in the favor of farmers, gradually left red clover in a very inferior position as a hay crop.

The common potato early became an important field crop. So abundant were potatoes in Colorado in 1862, that the *Miner's Register* of May 28, 1863, stated that thousands of bushels were "rotting for lack of purchasers and consumers." But in those days there was no outlet for surplus crops. Until long after the railroads had been built into Colorado there was no serious attempt to raise any crops to be marketed outside the borders of the territory—this with the exception of wheat, which, in the form of flour, was shipped in considerable quantities to St. Louis, and even as far as Boston. However, after the farmers in the vicinity of Greeley had learned to raise potatoes on a commercial basis, it became common enough to take advantage of outside markets. Such large yields were obtained that many potato growers made what seemed to be small fortunes in a few favorable seasons. Then diseases came, and a very promising crop proved disastrous to many growers. The San Luis Valley early proved to be a remarkably good potato region, and great quantities of excellent tubers were grown and marketed. But low prices in seasons of abundant yields, together with the high costs of transportation to adequate markets, made potato-growing a precarious business. On the whole, however, the growing of potatoes on a commercial scale has been of great advantage to Colorado. The potato is one of our important agricultural resources, and for many years the yield has been counted in millions of bushels; but it is grown on a commercial scale in only a few counties, the principal of which in 1925 were Rio Grande, Weld, and Montrose.

Another important crop is a relatively late introduction into Colorado. Like the potato, the sugar beet is

grown extensively in only a few counties. As a farm crop, the sugar beet can be grown for sugar only where there is a certain and nearby market—that is, where there is a factory near enough to permit the hauling of beets at a low cost per ton. There are other limiting conditions—as soil, climate, water supply, seasonal labor, etc. So it came about that sugar beet raising in Colorado has a history very different from potato growing.

It is worthy of note that the production of beet sugar in the United States did not exceed 1,000 tons until the season of 1888-89. Previous to that time there had been efforts to establish sugar beet growing and the building of beet sugar factories in Colorado. The story is very interesting. One of the early growers of sugar beets in Colorado Territory was Peter Magnes of Littleton. Replying to an inquiry from the editor of the *Longmont Press*, Mr. Magnes, in a letter published in the *Press* of February 21, 1872, gave an account of his experience. He began his letter by reminding the editor of the defeat in the Colorado Legislative Council of a bill “to give \$10,000 to the party or parties who should manufacture the first 200 barrels of sugar from beets grown in Colorado,” and expressed the fear that another year would pass before a sugar factory would be built in Colorado. (During the season of 1871-72, the total production of beet sugar in the United States was estimated by the U. S. Department of Agriculture at 400 tons. The production for 1924 was more than 1,000,000 tons.) Mr. Magnes stated that he had raised beets in 1870¹⁵ and 1871, the first year “at the rate of 132 tons on a small piece of ground,” and the second year he had “an enormous crop” which he did not weigh. His belief was that he could raise an average of seventy-five tons per acre. Basing his calculation on an analysis of his own beets made in 1871, which showed a yield of 290 pounds of sugar to the ton, he showed that an acre of beets would produce

¹⁵ One of the earliest references to sugar beets was made in the *Rocky Mountain News* of August 15, 1861, in a local note saying that “Mr. M. Brown, who owns and farms a fine ranch three miles above the city, on the west side of the Platte, deposited in our sanctum this morning some very large specimens of vegetable growth. One, a French sugar beet, weighs 7½ pounds, is 14 inches long, and nearly 7 in diameter.”

21,750 pounds of sugar; this at 15 cents a pound would give \$3,262.50 as the value of the sugar. The dry pulp at \$10 a ton would bring an additional \$112.50. These two items, amounting to \$3,375, made a handsome total income from a single acre of ground. But there was an expense (in the calculation) of \$10 per ton for raising the beets and drawing them to market, or \$750 an acre. Deducting this from the total receipts, the grower would have as "the net profit of an acre, \$2,625."

When a substantial farmer could make such a calculation as this, it need not be surprising that Colorado newspapers advocated the raising of sugar beets and the building of factories for turning them into sugar. A company was formed at Denver; seed was imported from Germany; and during the winter and spring of 1872 an active campaign was made to induce farmers to plant beet seed and raise sugar beets for the projected factory. The following January the *Greeley Tribune* seriously announced that "The sugar beet business, which started off last winter in Denver with great prospect of success, has amounted to nothing." It was stated that the farmers around Denver bought no more seed than was bought at Greeley, where "several thousand bushels" of beets were grown. The *Tribune* editor saw two special difficulties in the way of making a success of beet sugar making in Colorado—the first being the great cost of raising the beets by the labor then available; the second, the large sum required (not less than \$150,000) to put up beet sugar works. He referred to the experience of California, where the sugar companies raised their own beets by employing Chinese labor, and had no trouble in producing the beets for \$5 a ton. Moreover, he estimated the yield as ten tons to the acre, which was much below the estimate of Mr. Magnes, to say nothing of the wild guesses of the men who thought it possible to produce 300 tons per acre.

The time came, however, when Colorado was ready for the sugar beet business. In 1899 the first sugar factory was built at Grand Junction. The next year factories were put up at Rocky Ford and Sugar City. In 1901 the Loveland factory was built, followed the next year by the Greeley and Eaton factories. Then in 1903 three factories were

erected—at Fort Collins, Longmont, and Windsor. The new industry was now fairly on its feet. Farmers were learning how to handle beets from planting time till the crop was delivered at the beet dump. Individual failures were common enough. Before the sugar-producing side of the business had become well established—say about 1916—several costly experiences were suffered. The factory built at Monte Vista in 1911 proved unsuccessful, and the building was demolished, the machinery being moved elsewhere. The Grand Junction factory proved unprofitable. On the whole, however, the sugar factories were highly profitable to their promoters and owners. The sugar beet industry has been very advantageous to the State of Colorado. A new crop is always good for an agricultural region. It makes possible a more diversified farming system; it provides a profitable crop for certain lands which otherwise would have to be used for less profitable crops. Then, in the case of a crop like the sugar beet, a more intensive system of farming is enforced, with the result that the gross income per acre is very appreciably increased.

Other field crops of importance in certain sections of Colorado are field peas and beans. These are not new crops for the state. Both peas and beans were grown by the early settlers in Costilla County as early as 1854. As a field crop, peas were extensively grown in the San Luis Valley more than thirty years ago; and in other elevated regions, such as the upper Arkansas Valley, considerable areas were grown. One of the difficulties in connection with this crop was that satisfactory harvesting machinery and methods were slow in being made available. Beans as a field crop in Colorado, especially the northern and eastern part, are comparatively new; now the annual plantings amount to nearly a third of a million acres. Four counties produced the great bulk of dry beans grown in Colorado in 1925—namely, Weld, Elbert, El Paso, and Lincoln.

The newest of the field crops is head lettuce. This is also a localized crop. The 10,000 acres grown in 1925 were produced in counties of high altitude: Routt, Grand, Eagle, Rio Grande, and Costilla each had in excess of a thousand acres.

HORTICULTURAL CROPS

Scant mention has been made of efforts of the State of Colorado to promote horticulture; but the interest aroused in the various branches of the fruit-growing division of agriculture led to the passage by the Legislature of the Act of March 8, 1882, to promote and encourage horticulture and forestry, and to create a State Bureau of Horticulture. Of course this legislation was the outcome of activities on the part of fruit-growers and others. The first published report under the act just mentioned was issued in 1884. This report gives a sketch of the Colorado State Horticultural Society from its organization to January, 1882, beginning with the following statement: "On the 30th day of September, 1880, pursuant to a previous call, a meeting was held in the office of the *Colorado Farmer*¹⁶ for the purpose of organizing a State Horticultural Society." Eighteen men were recorded as being present, twelve of them from Arapahoe County, three from Jefferson, two from Boulder, and one each from Fremont and Weld counties. The first president was D. S. Grimes of Denver. Vice presidents were named from nine counties. The next recorded meeting was held on October 30th, also

¹⁶ The *Colorado Farmer* was the first agricultural paper published in Colorado. First published at Evans in January, 1873, it was issued as a monthly for a time. Its advertisement in the *Greeley Tribune* continued to give its address as Evans and its subscription price as \$1 per year until April 8, 1874. In the *Tribune* of April 22, the advertisement was changed, giving Denver as the place of publication of "a weekly sixteen-page paper devoted to the farming and stock-growing interests of Colorado," with a circulation of 2,000 and a subscription price of \$2. The paper was still published by its founders, Febles, Phillips & Co. Meantime, in June, 1873, Butler & Strahorn started the *Colorado Agriculturist and Stock Journal* at Denver. When the *Farmer* moved to Denver the *Agriculturist* was published by Robert E. Strahorn & Co. Later it was absorbed by the *Farmer*. About 1875 Mr. J. S. Stanger became owner of the *Farmer* and continued in control for a number of years. Other agricultural publications were started in the state, the most prominent of them being *Field and Farm*, which absorbed the *Farmer* about 1892, and itself disappeared in October, 1920, after having been purchased by the Capper Publishing Company of Topeka, Kansas.

at the office of the *Colorado Farmer*, at which a constitution and by-laws were adopted. Under the constitution, the next meeting of the society was held on January 7, 1881, this time at Denver University. Mr. Grimes was again chosen president, a new list of vice presidents (one being reelected) was chosen, H. G. Wolff was made treasurer, and Avery Gallup and W. E. Pabor recording and corresponding secretaries. Dr. Alexander Shaw and J. M. Clark were elected as members of the executive committee, of which the president, treasurer, and recording secretary were *ex officio* members under the constitution. The society was now ready for work; and one of the results of its efforts was the passage by the Legislature of the act above mentioned.

Thus far, only the beginnings of horticultural organization have been mentioned. But the society and its successors and a number of district and county horticultural associations organized under its inspiration have had great influence in spreading information and promoting interest in horticulture in Colorado. The reports published from 1884 until the State Board of Horticulture ceased to receive state support, contain much of current interest, many papers of more or less permanent value, and a considerable amount of historical material not to be found elsewhere. The best fruit men and women of the state took part in the proceedings and annual meetings. In the earliest of these reports may be found a history of fruit culture in the valley of the St. Vrain, where the first attempt to raise fruit was made in 1866. This beginning was successful—the result of the coming of a nursery agent from Atchison, Kansas. The report for 1902 tells of the first plantings on Clear Creek in 1862, where the young trees after thriving for two seasons were nearly all carried away by the flood of 1864; mentions that J. W. Cook of Ralston Creek and Henry Lee of Denver, brought nursery stock into the territory in 1870; that Jesse Frazier of Florence brought from Missouri, by team, a quantity of “different varieties of fruit stock” which he set out on his farm. “This nursery and orchard,” says the writer, J. S. Stanger, “was the nucleus from which has sprung the grand achievements of the orchardists of the Arkansas Valley.” The Frazer (or

Frazier) orchard was started in 1867, according to Judge W. B. Felton, who, in a paper read at the 1887 meeting of the Horticultural Society, mentioned it as the "boss orchard of the State." In 1888 Mrs. W. W. Taylor told the society that W. B. Osborn planted fruit trees on the Big Thompson in 1863 and also in 1865, both plantings being unsuccessful; she stated also that 1867 witnessed "the setting of many trees among the old settlers," and that a considerable number of them were living and bearing in 1888.

In 1891 Judge John C. Bell and others told the society (it was now the State Bureau of Horticulture) that the first adventure in fruit-growing on the western side of the Continental Divide was in 1877, just below the town of Ouray. In 1890 he saw one of the trees well loaded with apples. Delta County, he said, was entitled to the credit of making the history of fruit-growing on the Western Slope. Mr. W. S. Coburn, one of the early nurserymen and fruit-growers of Delta County, reported that in 1882 E. T. Hotchkiss and Samuel Wade set out a few trees in Delta County. Mr. Faucett made his first planting in 1883. The same year the first plantings were made at and near Grand Junction, by C. W. Steele and others. Here was to be the great fruit region of Colorado, including the counties of Delta, Mesa, and Montrose. Here the beginning was to be made in effective organization of fruit-growers for marketing their apples, peaches, and other fruits. So extensive were the orchards planted, that after some years it seemed that the fruit-planting business had been overdone. Indeed, in some sections it later appeared that unsuitable soils had been chosen for orchards; and these and other conditions made the orchard business very trying for a number of years; and all of the difficulties have not been surmounted even yet.

The small fruit industry was the earliest to be undertaken in Colorado. There were strawberries mentioned as early as 1860, and within a few years there was an abundance of small fruit of various kinds—gooseberries, raspberries, blackberries, etc. Naturally, the small fruit industry developed most largely near Denver; though there are small fruit sections in Boulder, Larimer, Fremont, and Pueblo counties that rival the best near the capital city.

THE TRUCK-GROWING INDUSTRY

The most noted gardens of 1859 were those of William Kroenig, on the Huerfano, and D. K. Wall of Golden. These were the pioneers of Colorado before the territory had a name of its own. Soon after there were gardens in every settled part of the region. In and near the mountain towns vegetables were grown as early as 1862. And practically everywhere there were notable successes in raising the hardy vegetables.

As the cities increased in population, enlarging the demand for fresh vegetables, the small gardens were not sufficiently productive to provide a dependable supply of vegetables; and so it was not long until truck farms were the numerous successors of the small gardens which furnished the early supplies of vegetables for the tables of the pioneers and the near-pioneers of the '70s and '80s. The industry grew; and the territory began to be aware before many years that there were special regions adapted to particular garden crops.

From almost the earliest days melons were raised in Colorado; but the melon industry began to be recognized as a specialized branch of farming about 1880, when Mr. George W. Swink of Rocky Ford shipped 200,000 pounds of watermelons from his farm. The watermelon was later outranked in importance by the Rocky Ford cantaloupe. The latter was not confined for long to the region it made famous. Many parts of the state early rivaled the lower Arkansas Valley for quality of cantaloupes.

THE HONEYBEE AND ITS PRODUCTS

The honeybee was an early comer. In an article in the Honey Day Edition of the *Longmont Times* of October 4, 1892, Mr. Harry Knight of Littleton stated that the first colony of bees was brought to Colorado in 1862 by Isaac McBroom of Fort Logan. This colony was hauled "across the plains by ox team." These bees died without increase, Mr. Knight wrote. In 1866 Governor A. C. Hunt brought a colony to Denver by wagon, and these died the second winter, also without increase. Of the colony owned by Mr. McBroom, it is interesting to have Mr. Knight's account

supported by an item in the *Rocky Mountain News* of October 22, 1862:

Pike's Peak Honey.—We have been shown by Mr. Dunn, at his store on Front street, a box of as fine looking honey, placed in the comb by bees, as we have ever seen. It is from a hive owned and brought across the plains early last spring by Mr. McBroom of Bear Creek. It is said that the amount of honey stored by these bees is unusually large, which speaks well, as a first experiment, for Colorado as a bee country.

In 1902, in anticipation of the meeting in Denver of the National Bee-Keepers' Association, the writer (as secretary of the Colorado State Bee-Keepers' Association) prepared a pamphlet called *Bees in Colorado*. This brochure gave a rather extended account of the bee-keeping industry of the state; and from it the quotations are made from Mr. Knight's articles and some of the information gleaned which is to follow. The Rev. R. H. Rhodes, then (1902) of Fort Lupton, informed the writer that the first colony of bees in Jefferson County was brought from Coon Creek, Iowa, in a "log gum" by F. J. McQuiston, who arrived with his colony at Denver on the first day of January, 1864. During the time Mr. McQuiston owned this colony he several times refused to sell it for \$100. The first honey taken from the hive was sold in Central City at \$1 a pound. Mr. J. B. Adams reported that David J. Lykins was the pioneer bee-keeper of Boulder County, beginning his operations "some time in the sixties."

The Union colonists of Greeley got into bee-keeping soon after their arrival in 1870; and in the *Greeley Tribune* of June 7, 1871, may be found a "Bees in Colorado" article which lists six regions and towns in the territory which had no bees and three where bees were kept: there was one colony on the Big Thompson, one at Denver; and there were six at Greeley. But the *Tribune* was good enough to report two weeks later that a correspondent of the *Denver News* had stated that there were seven colonies of bees on Clear Creek and "probably 30 in the Territory." The Greeley editor was glad to learn this; "for we made particular inquiry of agricultural men in Denver last year, and could hear of none except the one belonging to Gov. Hunt."

The Colorado State Bee-Keepers' Association was organized in Denver by J. L. Peabody, Elisha Milleson, and Mrs. Olive Wright. Mr. Peabody was the first president. At this time, according to Mr. Knight's story, there were about 250 colonies of bees in the state. The association was incorporated in 1888, and at one time had the distinction of having the largest membership of any similar organization in the United States. In 1899 Mr. Frank Rauchfuss, then secretary of the association, estimated the number of colonies in the state as 70,000. In 1902 the association had 290 members. In the pamphlet above mentioned the total number of colonies was given as 78,300, distributed as follows: Arapahoe County, 8,000; Bent, 2,000; Boulder, 8,000; Chaffee, 200; Delta, 4,000; Douglas, 300; Elbert, 200; El Paso, 800; Fremont, 2,000; Garfield, 1,200; Huerfano, 2,000; Jefferson, 8,000; La Plata, 1,000; Larimer, 6,000; Las Animas, 1,500; Logan, 2,500; Mesa, 5,000; Montezuma, 2,500; Montrose, 5,000; Morgan, 3,000; Otero, 7,000; Pitkin, 300; Pueblo, 1,500; Rio Grande, 300; Weld, 6,000. The census of 1900 had shown that 4,518 farmers owned 59,756 colonies of bees. The gains up to 1902 had been considerable; and the best informed at that date felt justified in the higher estimate previously given, though no one was willing to vouch for the real accuracy of the estimates by counties.

Suggestive of the unity of interests among bee-keepers is the history of the Colorado Honey Producers' Association, one of the oldest of Colorado coöperative organizations. Organized under the corporation law of the state January 4, 1899, this coöperative concern has been doing a successful business ever since. The first year it paid an 80 per cent dividend on its capital of \$10,000. That was the last big dividend; for that payment represented the ways of corporations, not of coöperative associations. Thereafter the profits in excess of 8 per cent were returned to the members in proportion to their sales through their association. Members used to lend money to the manager without interest in order that the business might be carried on without dependence on banks. After twenty-seven years of diligence and success in business, the association now has an authorized capital of \$100,000, occupies its own

four-story building on Market Street, Denver, and is still under the active management of the man who began when the association was organized, and did his work as manager while still employed five days a week in another business. In the beginning, the business was almost entirely local; now it reaches out into New Mexico and Wyoming, into Utah, Idaho, Montana, and other states, with outlet for its surplus in the great market centers of the East.

Has the bee-keeping industry made progress in Colorado since the great days of the last decade of the old century and the first of the new? Yes, and no. The business has changed. Changes in the acreage and in the method of handling of alfalfa have reduced the available bee pasturage, and there are fewer colonies of bees now than twenty-five years ago. A paragraph in the Colorado yearbook for 1926 says: "The Census Bureau reported 63,253 hives of bees on 3,990 farms on January 1, 1920. This compared with 71,434 hives on 2,694 farms on April 15, 1909. The honey produced in 1919 was 2,493,950 pounds, valued at \$573,610, which compared with 2,306,492 pounds, valued at \$225,883 in 1909." The same yearbook expresses the opinion that the number of hives in the state is increasing, but that the surplus per hive had not been so favorable prior to 1925, and quotes the deputy state bee inspector as authority for an estimate of 100,000 colonies in 1924.

THE ECONOMIC VALUE OF AGRICULTURAL PRODUCTS

In the pioneer days the value of agricultural productions was usually high. The local farmers had hundreds of miles of more or less dangerous road between them and their rival producers on the Missouri River; and when the demand in Denver and the mining towns in the mountains was greater than the local supply, they could and did expect high prices. But merchants were thrifty people in the early days, and they did not hesitate to draw their supplies from New Mexico and Utah when they could do so to financial advantage. "Taos" stood for a large and productive farming region in the '60s and before; and Utah also had considerable surpluses which reached the Colorado markets in competition with the products of

Colorado farms. Then there were years when the crops in Colorado were in excess of the effective demand, farmers not having the capital and storage facilities to enable them to hold their crops for the higher prices that might be obtained in the winter or the spring following harvest. So the total value of agricultural crops was not great in any year before statehood. The estimate of three and a half million dollars as the total value of crops in 1869, as made by Mr. W. R. Thomas, seems to have been amply high, considering that he put the total productions of the farms, stock ranches and ranges, manufactures, and mines at \$10,000,000. Now the total value of crops has far exceeded the dreams of the most sanguine and far-seeing of the pioneers. The estimate for 1925, as given in detail below, amounts to nearly one hundred and forty million dollars—probably forty times the value of the crops of 1869 or 1870.

For comparison with the detailed estimate which follows, and which is taken from the *Yearbook* of the Colorado State Board of Immigration, it will be instructive to consider the estimates of the first report of Colorado's first Board of Immigration, published in 1874:

"The value of the agricultural crop of 1868, was not over \$2,000,000; in 1870, it was not much over \$3,500,000; in 1872, it was at least \$4,000,000; while in 1873, the estimated value of the crop is \$5,000,000."

The same report shows that returns to the territorial auditor put the number of cattle in the territory at 300,000 head, and the number of sheep 315,000. On the authority of President J. L. Bailey of the Stock Growers' Association, the secretary of the Board of Immigration put the number of cattle at 450,000 head and the sheep at 472,000. In a pamphlet issued in 1873, the Board of Immigration showed that reports to the auditor gave the number of live stock as follows:

Cattle	243,000
Sheep	270,000
Horses	23,000
Goats	10,000
Asses (pack animals)	10,000

CROP ACREAGE, PRODUCTION AND VALUE, 1925

Kinds of Crops	Acreage	Production	Value
Winter Wheat -----	896,000	10,752,000 Bu.	\$ 14,623,000
Spring Wheat -----	252,000	3,780,000 Bu.	5,103,000
All Wheat -----	1,148,000	14,532,000 Bu.	19,726,000
Corn ¹ -----	1,494,000	22,410,000 Bu.	15,687,000
Oats for Grain ² -----	230,000	6,210,000 Bu.	3,105,000
Barley for Grain ³ -----	410,000	8,610,000 Bu.	4,994,000
Rye for Grain ³ -----	85,000	850,000 Bu.	570,000
Emmer -----	12,780	320,000 Bu.	192,000
Grain Sorghums for Grain --	50,000	600,000 Bu.	426,000
Grain Sorghums for Forage --	246,000	1,722,000 Bu.	1,223,000
Sweet Sorghums -----	130,000	260,000 T.	1,560,000
Broom Corn -----	12,000	1,200 T.	120,000
Field Peas ⁴ -----	65,000	910,000 Bu.	1,019,000
Dry Beans -----	320,000	2,240,000 Bu.	5,376,000
Potatoes ⁵ -----	86,000	14,190,000 Bu.	21,994,000
Sugar Beets -----	131,000	1,449,000 T.	9,129,000
Root Crops for Stock Feed --	1,400	19,600 T.	118,000
Cabbage (Com'l) -----	2,000	23,000 T.	542,000
Onions (Dry) -----	3,520	1,144,000 Bu.	1,018,000
Cauliflower (Com'l) -----	1,030	160,000 Cr.	163,000
Tomatoes (for Mfg.) -----	3,100	25,500 T.	293,000
Cantaloupes and Honey Dew Melons -----	9,780	1,604,000 Cr.	1,315,000
Cucumbers for Pickles -----	3,340	341,000 Bu.	341,000
Cucumbers for Seed -----	5,925	-----	504,000
Peas for Canning and Market	6,080	-----	986,000
Beans for Seed -----	19,200	172,800 Bu.	518,000
Lettuce (Com'l) -----	10,500	1,396,000 Cr.	2,150,000
Celery -----	800	336,000 Cr.	380,000
Flax Seed -----	870	4,000 Bu.	7,000
Millet Seed ⁶ -----	33,000	264,000 Bu.	315,000
Alfalfa Seed ⁷ -----	4,000	16,000 Bu.	144,000
Other Garden and Seed Crops	8,175	-----	818,000
Tame Hay, All Varieties -----	1,245,000	2,676,000 T.	32,112,000
Wild Hay -----	360,000	360,000 T.	3,888,000
Farm Gardens -----	8,000	-----	400,000
Apples -----	-----	3,200,000 Bu.	3,520,000
Peaches -----	-----	450,000 Bu.	855,000
Pears -----	-----	510,000 Bu.	586,000
Cherries -----	-----	3,600 T.	396,000
Miscellaneous Fruits -----	-----	-----	550,000
Sugar Beets Tops ⁸ -----	131,000	-----	590,000
	<hr/> 6,141,500	<hr/> -----	<hr/> \$137,630,000

¹ This includes the entire acreage of corn harvested in every way and the value estimated as if it were all harvested for grain. It is estimated that about 18 per cent is cut for silage, hogged off or fed as dry forage.

² In addition to the acreage shown here it is estimated that 90,000 acres of oats was cut green for hay, and this additional acreage appears in the hay table.

³ In addition to the acreage shown here it is estimated that there was 33,000 acres of rye cut green for hay or pastured, and a small acreage of barley similarly harvested. The acreage of barley for grain and hay combined is shown in another table.

⁴ The acreage of field peas accounts for the entire crop, no matter whether threshed for grain or fed on the vine, the grain value being approximately the same in either case.

⁵ Although the acreage of potatoes harvested as reported here is based on census reports, the returns of county assessors and reports of car shipments, it is possible that on later revision these figures will be found to be above the acreage actually harvested in 1925.

⁶ This acreage is additional to the 50,000 acres of millet harvested for hay and included in the hay totals.

⁷ Included in the acreage of alfalfa as hay and not carried into the total acreage.

⁸ Included in acreage of sugar beets harvested and not carried into the total acreage.

NOTE—This table includes no acreage of pasture, either seeded or native, except as shown in preceding notes.

CHAPTER XII

THE RANGE LIVESTOCK INDUSTRY

By Alvin T. Steinel

BIRTH OF A NEW INDUSTRY—BEGINNING OF THE TRAIL MOVEMENT—DAYS OF THE OPEN RANGE—THE SHEEP INDUSTRY—LIVESTOCK INDUSTRY ON AN ORGANIZED BASIS.

BIRTH OF A NEW INDUSTRY

Sheep and cattle were already on the grass of the Southwest ranges when gold was discovered in the Pike's Peak region and the new Commonwealth of Colorado was born. Mexican settlers south of the Arkansas and on the upper Rio Grande, as well as a few Americans who kept trading posts or ranches on the Santa Fe Trail, kept cattle and sheep. Cattle were trailed across the plains in 1846, when the Army of the West, on the march to New Mexico, brought its live beef in a drove that was pastured on the virgin prairie grass.¹

Wagon trains that crossed the plains were drawn by oxen. These work animals were sustained by the native grasses from the time they left the Missouri River to arrival at the foothills. Emigrants brought milk cows and wayside pasture maintained the milk flow. While the gradual disappearance of tree growth on the westward course gave the country a desert aspect, grass nevertheless relieved the fears of the pioneers who saw in the ample turf a sign that the Great American Desert would sometime become a rich pastoral empire. Even in the heat and drouth of midsummer, when the plains assumed the sear and yellow tint of untimely autumn, these travelers to the new gold country saw how eagerly the withered vegetation was devoured by

¹ Henry Inman, *The Old Santa Fé Trail*, 104.

their cattle and counted it a sign of the favor of a newly discovered land of plenty. Nor was that the only evidence.

More forceful than observation of domesticated stock was the lesson of wild life, for literally millions of antelope and buffalo found sustenance upon these prairies and the emigrant, though primarily in search of gold, saw there was something tangible to fall back on if the yellow metal proved elusive. While these were rather indefinite impressions, the practical discovery of the grazing value of the new country was made by the ox drivers in that first autumn of 1858, when they were facing a winter with many oxen and no hay stacks in sight around which to tether them during the months of idleness. Among these resourceful freighters was "Colonel" Jack Henderson, who reached the new settlement at the junction of Cherry Creek and the Platte River late in 1858, with a train of supplies from Lawrence, Kansas.² There were no accommodations for oxen in the first fall, so Henderson turned his work stock out on the grass, as did others. Early in the spring of 1859 he rode out into the wilderness eastward toward Bijou Creek to hunt buffalo. On the way he saw some oxen grazing and on riding close, recognized his own brand on them. They were in fine condition, having grown fat during the winter on the native pasture. Henderson rounded up his oxen and drove them back to town, pleased with the discovery and announcing it to the people of the settlement.³

Others made the same discovery, Irvin and Jackman, freighters, turning out 400 footsore oxen late in 1859 in the richly overgrown bottomland along Bijou Creek near the present site of Deer Trail and rounding up in the spring of 1860 two-thirds of them fat enough for killing. Daniel Holden, a settler on Cherry Creek a few miles above Denver, and the first to make it a business to supply the new settlement with milk, turned from dairying to beef production after a winter's lesson on the value of the grass. Still

² Henderson's title had been earned in the border troubles of eastern Kansas. His name was given to an island in the Platte where he established the first public corral or cattle yard.

³ *Denver Republican*, October 1, 1883, in T. F. Dawson's *Scrap-Books*, Vol. XVI, 7.

another who left a clear record was Andrew J. Williams, who, with his partner Blake, appropriated the crumbling adobe corral at Fort Lupton early in the winter of 1858 and had the experience of finding his cattle in better flesh in the spring than when they were turned out to graze in December. David Ewing, a pioneer of Fort Lupton, said in later years that the Williams and Blake cattle were the first domestic animals to graze along the Platte west of Fort Kearney. The several authentic incidents thus recorded are assurance that the discovery of the value of the new country for grazing was made quickly and by many of the arriving wagon bosses and emigrants. They took advantage of it commercially to get rid of their foot-sore and broken-down oxen to the butcher after a season on grass.

To the practiced eye of the grazier it was clear that these western grasses differed in character from the varieties to which he had been accustomed in the States. In winter they were not broken down by frost like the moisture-laden grasses of the East, but they stood straight-stemmed, erect and dry—some kinds even fluffy—and although withered and yellow, retained their nutriment as does cured hay in the stack. It was a discovery confirmed by later experience that grasses cured by nature on the ground not only maintained stock in good flesh but that animals actually increased in weight during the winter. At first cattlemen believed the grasses possessed some special, valuable properties, but later scientific interpretations attributed the nutritive qualities to the effects of the dry climate in curing the grasses on the ground.

Game was plentiful in the new settlement, nevertheless the American's taste for beef had to be satisfied. Ten cents a pound at retail was the prevailing price in Denver during the first years, but in the mining camps beef brought prices that fluctuated with the supply of broken-down oxen, as well as with the quantity of gold dust being panned.

Fat cattle were listed as a market commodity in Denver as early as 1862, when L. Butterick, a butcher, bought seven head of beeves at five and a half cents a pound, live weight, paying \$525 for the lot.

"No fatter cattle can ordinarily be found on the markets

of the eastern states, notwithstanding the fact that the latter are supplied with stall-fed beeves, while here they are driven off the plains of the Great American Desert(?), where they feed on grass of their own finding the year round," was the comment of *The Rocky Mountain News* (May 17, 1862) in recording this first beef cattle marketing transaction. Here was proof that, within four years, grass-fed beef production had assumed the character of a distinct industry. That it was started with discarded oxen was a makeshift illustrating the adaptability of the pioneers to their new environment. That oxen were not the sole source of beef is shown by the story of Samuel Hartsel, a pioneer of South Park, who was in the cattle business fifty years. He was one of the first to bring in purebred cattle. Hartsel came to Colorado in 1860, going to the Tarryall diggings. He found no gold, so he went to herding oxen. Sore-footed and sore-necked animals were being sold for beef by the freighters there as elsewhere, and Hartsel began to buy these discarded cattle, putting them out on grass for fattening. He paid \$10 to \$20 a head for them and sold them fat at \$90 to \$100. His first important sale was in the spring of 1863 to a butcher at Hamilton, a mining camp that long ago disappeared from the map. He got \$1,000 for ten animals.⁴

In the spring of 1861 Hartsel bought out two men from Iowa, Duke Green and Ed Shook, who came across the plains with twenty high grade and two or three registered Shorthorn cows. In 1864 Hartsel went back to Missouri, where he bought 148 cows and several bulls of the Shorthorn breed, all eligible to registry, from Tom Gordon, a Clay County breeder, whose grandson, Gordon Jones, in later years was prominent in the banking business and livestock industry at Denver. It took Hartsel two years to drive these cattle to Colorado, the caravan with which he traveled being held up by Indian warfare along the Santa Fe Trail.

During the first two years of settlement Texas drovers began to come in from the Southeast, their herds subsisting

⁴ The *Denver Record-Stockman*, Historical Review Edition of January, 1916, contains a personal narrative of Samuel Hartsel.

on the grass while they peddled cattle to the new settlements along the Fountain and over the Arkansas Divide to the Platte and Cherry Creek. In 1861 notice was taken of this trade by the Territorial legislature in the passing of an act forbidding non-residents to import any cattle, sheep, goats, mules and hogs into the counties of Huerfano, Pueblo, Fremont, Jefferson, Boulder and Costilla for "grazing, herding or feeding same or quartering them upon the public domain, or upon the lands of any person or persons." Colorado land owners were exempted, as were those who were lawfully driving through or selling stock, the object of the law being to prevent permanent occupation of grazing areas by non-residents.

Again in 1867 legislation was resorted to, this time in drastic fashion, to stop the determined northward movement which the Texans had started. This law read as follows:

"It shall not be lawful for any person or persons to import into the Territory of Colorado any bull, cow, ox, steer or cattle of whatever description known as 'Texas cattle' for the purpose of small stock raising, growing, herding or feeding, or for any purpose whatever."

The only attempt made to enforce the law forbidding importations of Texas cattle was in 1869, by a group of Douglas County ranchmen, who had American cattle. Losses from a mysterious fever, which the Texas trail herds were spreading, had mounted to over a thousand in that county during 1868 and, with the appearance of the first trail herd in 1869, an attack was made at night. Shots were fired to stampede the herd, four head being killed and thirty wounded, while the balance of the cattle scattered. The drover was arrested and fined \$50. He then rounded up his remaining animals and drove on northward.⁵ This incident led to serious controversy between owners of well bred American cattle and those who were attracted by the chance to make money in handling Texas cattle, with the result of repeal of the law by the Territorial Legislature of 1870.

There was little encouragement for any new industry

⁵ *Rocky Mountain News*, April 12, and April 26, 1869.

while the fate of the Union hung in the balance, and beef production during the Civil war years was exclusively for supplying local demands. Sheep had a slight foothold in Southern Colorado among the early Mexican settlers and there was considerable traffic in wool over the Santa Fe Trail, but this originated principally in New Mexico. Not until the railroads came, with quick transportation for wool, did sheep raising appeal to Colorado ranchmen. Very few cattle herds were found on the open plains east of Kiowa Creek until after 1866. During the war Indians took advantage of disturbed conditions and the lack of military forces in the West to blockade the lanes of wagon and stage traffic, as well as to harass, rob and murder settlers.

War contracts had been of trifling benefit to the Colorado livestock producer. Beef was being furnished to a few army posts; horses were bought in Colorado from those who rounded up the wild broncos, and driven east to supply the Union army. Good prices were paid locally for work oxen, which were selling at \$150 to \$200 a yoke. Mules were scarce but greatly desired for work in the mining camps and for stage transportation, prices running \$400 to \$800 a span. These prices were quoted in 1864 when mining was fairly prosperous, but stagnation, due to Indian depredations, held back development of the plains.

Oxen were the principal draft animals, though the use of horses and mules was increasing as rapidly as a supply could be obtained. Quicker transportation was the demand of the hour. Railroads were projected but not yet built beyond the Missouri River.

Camels, the oriental "ships of the desert," were being exploited for transport service. One day in June, 1866, there lumbered into Denver a camel-drawn wagon which had come from the Pacific Coast with Omaha as its destination. L. S. Musgrave drove the outfit. He housed his beasts in a tent and gave an exhibition of the carrying capacity of the camels for the edification of the curious. A thousand pound load and forty miles a day without a stop for water was the claim made for the "ships of the desert." It was planned to organize an overland mail and express service with camels operating between Omaha and Sacramento. Nothing came of the effort to popularize camel

transport, because the railroads were coming and people were looking forward to a change in conditions that was to revolutionize the life of the new community.

A record of the second annual fair of the Colorado Agricultural Society, held at Denver, October, 1867, indicates that Colorado livestock producers were building on better blood than the Spanish breeding that prevailed in Texas. P. D. Miller of Colorado City drove to Denver for the fair with fourteen head of Durham cattle, headed by a bull sired in Kentucky, weighing about 2,000 pounds and valued at \$300.⁶ Fifty head of horses and cattle were exhibited, and there were also pigs and chickens. At the third annual fair, October 6, 1868, very few cattle were shown, as the Indians were on the warpath and it was not safe to go on the trail with a herd or to leave the ranch unprotected.

As if in preparation for the floodtide of Longhorns, was the ruthless slaughter of buffalo that reached its maximum in the early '70s. By the time the range was crowded with cattle the last of the shaggy-maned bison had vanished. The white man found the western prairies black with bison. An age of Indian occupation had not decreased the vast hordes of meat animals that drew their sustenance from the nutritious grasses of the plains. The white man came to subdue the country and within fifteen years, where millions of buffalo had roamed, remained only scattered remnants of a vanishing animal race.

Speculation as to what might have happened in the range livestock industry had the buffalo been allowed to remain and become domesticated is idle. It was taken for granted that there was no room on the range for both wild and domesticated cattle. Be that as it may, history has no kind words for the buffalo skinner—the huntsman who shot only for the hide that became the buffalo robe of commerce. Col. R. J. Dodge of the United States army is authority for the statement that the destruction of buffalo

⁶ Others who showed cattle of quality, mostly of the Durham breed, were Wilson and McLaughlin, G. J. Ross, Fred Buckman, I. H. Bachelor, J. W. Clure, C. Lerchen, L. K. Perrin, J. T. Yunker, J. W. Cline, A. H. Smith and Brother, G. F. Gallamore, A. H. Jacobs, A. J. Pennock, A. Baker, Thos. M. Sloan, L. H. Dickson, and Peter Magnes.

during 1872, 1873 and 1874 was upward of four millions (for the three years), three-fourths of the kill being for the hides alone.⁷

Authentic accounts in Government reports tell of almost unbroken masses of bison moving over the plains in herds, sometimes one hundred miles in extent. Views from hill-tops with field glasses were had of grazing bison in continuous mass for ten to twenty miles in all directions. Four or five years later an observer saw "a continuous line of putrescent carcasses, so that the air was rendered pestilential and offensive to the last degree."⁸ Inman says that in thirteen years, from 1868 to 1881 in Kansas alone \$2,500,000 was paid out for buffalo bones, this sum indicating skeletons of 31 million animals.⁹

Though not clearly realized then, it became a settled conviction later that the slaughter of the buffalo was one of the irritants that led Indians on the warpath and many a family of settlers, innocent of harm toward the Redskins and taking no part in the extermination of the buffalo, was wiped out in revenge for wanton destruction of the Indian's meat supply. This meat, too, had sustained white settlers on the plains before cattle became plentiful. The most acute loss to the settler was that of the fuel—the buffalo chips or dried dung which was the only fuel available on the treeless plains before the days of the railroad and the coal mine.

Disappearance of the buffalo alone would have been sufficient to bring to an end the nomadic existence of the plains Indians. "The buffalo supplies them with almost all the necessaries of life; with habitations, food, clothing and fuel; with strings for their bows; with thread, cordage and trail ropes for their horses, with coverings for their saddles, with vessels to hold water, with boats to cross streams, with glue and with means of purchasing all they desired from the traders. When the buffalo are extinct they, too, must dwindle away." Thus wrote Francis Park-

⁷ F. V. Hayden, *Report of the United States Geological Survey*, 1875, page 556.

⁸ *Ibid.*, 557.

⁹ Henry Inman, *The Old Santa Fé Trail*, 203.

man in 1846 (*The Oregon Trail*, p. 128). Thirty years later what he foresaw had come to pass. The way had been cleared for a floodtide of Texas cattle that overran the buffalo range.

While discovery of Colorado's natural grazing resources would have led, eventually, to large scale beef production, development, though on a sounder economic basis and with far better quality, would have been much slower had not the misfortune of war wrecked the range industry in Texas. So interwoven are the threads that bind Texas and Colorado that we must go to the Lone Star State for beginnings. The Civil war had put an end to traffic in Texas cattle over trails to St. Louis and other markets along the Mississippi. Shipping from Texas ports to New Orleans for the Confederate army ceased after the capture of New Orleans by the Union forces in 1862. No other outlets were available. Stagnation came over an already ill-managed, haphazard industry. Cattle increased to almost incredible numbers until the plains of Texas were literally overrun.

With this great surplus securely locked in the South behind the barrier of war, there was an acute shortage of beef in northern markets, where the demand for the army and for civilian use could not be supplied. Ordinary steaks and roasts were selling in the cities for 40 cents a pound and the workingman's portion was boiled beef once a week. With virtually a beef famine in the upper Mississippi Valley, Texas and Indian Territory counted four million head of cattle, without an open road to market at the close of the Civil war. Without railroads, deprived of gulf and river transportation, north-bound trails overgrown with grass, the plight of the Texas drover was pitiful. A million head of unbranded cattle roamed the prairies south of the Red River. Mavericking had been legalized for the time being in Texas and the word, signifying ownerless cattle, had been incorporated in the vocabulary of the range.¹⁰

¹⁰ Samuel A. Maverick, Texas pioneer, member of the Congress of the Republic of Texas, temporarily resided at Decrow's Point on Matagorda Bay in 1845. A neighbor who owed him \$1,200 which he could not pay in cash, gave him 400 head of cattle to square the debt. Maverick turned them over to a family of negro slaves, as cattle were worth little. The cattle grazed uncared for and their

Stagnation unparalleled afflicted an industry that had grown up unchecked by competent knowledge of marketing, unprepared for war, and fostered blindly by the lavish hand of nature, with bountiful grazing resources, a fecund breed of cattle and the desire of men for the lazy life of the hacienda and a picturesque, gainful calling, without arduous labor.

It was not a Texan who led the way out of discouragement and distress, but a shrewd cattle trader from Illinois, Joseph G. McCoy by name. He knew there was a shortage of beef in the populous North and that farmers in Illinois and Iowa were growing a surplus of corn that might well be fed. Also, he was aware that no cattle were coming through from Texas to the St. Louis market and that such trail herds as had been started towards Sedalia, Missouri, terminus of the Missouri Pacific Railway in 1866, were being turned back at the Missouri-Kansas line by border ruffians as well as by mobs of citizens, who feared introduction of cattle diseases.

The Kansas Pacific had been completed to Abilene and construction was being pushed westward. McCoy conceived the idea of diverting trail herds from Texas and the Indian Territory to Abilene, avoiding border opposition and getting cattle to the railroad for shipment to Chicago. He broached the subject to the officials of the Kansas Pacific, who had no faith in the plan but were persuaded to build pens and loading chutes to accommodate 3,000 head of cattle. McCoy then started a man south on horseback to the Chisholm Trail¹¹ to intercept herds and tell

increase overran the neighborhood unbranded. The settlers referred to them as "Maverick's." The term, first definitely employed, soon became general, being applied to the thousands of unbranded and ownerless cattle that grazed the coastal plains of Texas. The term spread to other regions and finally reached Colorado with the first trail herds, and later was incorporated in the phraseology of statutes that forbid "mavericking," or appropriating unbranded calves. This explanation is confirmed by the Texas State Historical Association.

¹¹ Confusion over trail names and routes has been cleared up by the Old Time Trail Drivers Association, who approve the version given by W. P. Anderson as to the route of the original Chisholm

drovers about the new shipping point at Abilene. Before the season of 1867 was over 35,000 head had been handled at Abilene, selling there at \$15 to \$18 and bringing \$24 to \$28 a head at Chicago. Word spread of the new market and 1868 found Abilene crowded with buyers, among them many Colorado ranchmen, who came to stock up pastures with Longhorns.

That was the beginning of a remarkable movement that reached 75,000 in 1868, 150,000 the following year and was destined to carry millions of southern cattle from the breeding grounds of Texas and Indian Territory to the eastern markets and to the ranches of Western Kansas, Nebraska, Colorado, Wyoming, the Dakotas and Montana. The fourth year McCoy's estimate was that 700,000 head were handled over the Abilene Trail.¹² Thin and immature cattle reaching the railroad found ready buyers from Colorado and other range states and went westward by rail or trail. The Atchison, Topeka and Santa Fé was under construction and the Kansas Pacific was nearing the Rocky Mountains. Following Abilene came other cow towns—Newton, Great

Trail. Anderson was station agent for the Kansas-Pacific Railway at Abilene. According to his description, the point of origin of the Chisholm Trail was near the junction of the Grand River and the Arkansas in Indian Territory (now Oklahoma). It was named for Jesse Chisholm, a Cherokee Indian trader, who trailed cattle to Fort Scott, Kansas, and other army posts prior to the Civil War. Later the trail followed up the Arkansas into Kansas, having its main Kansas base along Chisholm Creek near Wichita. Diversions reached various army posts and a route was laid out to Abilene. The extreme western point mentioned by Anderson, as reached by the Chisholm Trail, was Fort Lyon, Colorado. There was another trail from West Texas, up the Pecos into New Mexico and Colorado, with a diversion to Dodge City, known as the Tascosa Branch. This Pecos Trail was often erroneously called Chisholm Trail, confusion arising from the fact that John S. Chisum of Colburn, Texas, who trailed cattle to Colorado, used this route. The approved name for this route was the Goodnight-Loving Trail. John Chisum had no knowledge of the Cherokee trader whose name was spelled "Chisholm."—Compiled from letter of W. P. Anderson in *The Trail Drivers of Texas*, a volume edited by J. Marvin Hunter and published by the Cokesbury Press, Nashville, Tennessee (Revised Edition, 1925).

¹² J. G. McCoy, *Historic Sketches of the Cattle Trade*.

Bend, Dodge City, Trail City—each flourishing riotously in wickedness like the proverbial green bay tree, then falling into decay or, on later revival, assuming the character of substantial, respectable communities after their fling in the drama of the plains.

The railroads were intent only on spanning the continent from east to west. Nature had provided no water courses to connect the grass lands of Texas and Colorado, so cattle had to be traileed at least to the railroad. There grew up through this lack of transportation a scheme of beef production unique in history and which, from its inception in the distress of the Texas drover, has throughout been marked by great fluctuations, tremendous profits and corresponding losses; turbulence, strife, uncertainty and change, baffling to the economist, unfavored by the keen banker, but highly attractive to the speculative instinct that gave the cowman his daily thrill. It was a business that had hope as working capital, enthusiasm its chief asset and disillusionment an ever threatening liability.

While the railroads brought quick relief to overproduction on the Texas range, they also furnished an easy outlet for finished cattle from Colorado pastures. The first trainload that went east from Colorado was loaded out in 1869 at Kit Carson, then the terminus of the Kansas Pacific. George Thompson brought this drove from Las Animas. This was the beginning of traffic that became important by 1872 when the total cattle exports by rail numbered 46,208 head, valued at over a million dollars. Cattle marketed eastward brought about \$35 a head and those going west, \$17. No record is available of the trail movement during that year, but far more cattle were traileed than shipped by rail.

Up to 1870 each owner rounded up his own herds, but it was found expedient now to combine forces and gather up the cattle in spring and fall on the community plan, the first organized roundup taking place below Platteville in 1871.

The call for the first meeting of Colorado stock growers was signed by Joseph L. Bailey, proprietor of the Bull's Head corral in Denver. The organization meeting was held at the American House the evening of January 9, 1872, A.

J. Williams being chairman, and W. Holly, secretary. The purposes set forth by Bailey were: "To protect the interests alike of stockmen, ranchmen and farmers, and to harmonize, as far as possible, whatever might be conflicting in the great interest of agriculture and stock raising."

Efforts to carry out the plan according to Bailey's purposes failed, though the first two sessions included both the plowman and the cowman; in fact, also the sheep raiser. It soon became evident, however, that harmony was impossible between such divergent interests and those whose chief business was farming made no effort to remain members of an association organized for the protection of the range industry.¹³

A herd law was on the statute books at this time, having been passed by the Territorial Legislature in 1864. It applied only to Douglas and Weld counties but it seems never to have been enforced. The existence of this statute furnishes effective proof of the fact that general agriculture was in the ascendancy in Colorado before the range industry became important. At various times in later years farmers have made efforts to obtain a herd law which would throw the burden for stock damage on the owner of the herd, but without success. The stockmen succeeded in having it established as a principle of law that it is incumbent upon the farmer in a range state to protect his crops, and the grazier, by the very nature of his nomadic business, could be held liable only in case his animals broke through a prescribed fence, whether this be of barbed wire, or poles, or other construction firm enough and in proper repair to hold stock out.

Legislation was passed at the behest of the newly organized Stock Growers Association in 1872, putting the burden on the railroad company for losses killed by train. A

¹³ Those who helped shape the organization were Bailey, I. P. Van Wormer, J. H. Pinkerton, W. W. Roberts, and George W. Brown. The first legislative committee was composed of John G. Lilly, L. F. Bartels, Peter Erkens, John S. Wheeler and John Hitson. Permanent officers chosen were: John G. Lilly, president; J. L. Bailey, vice-president; W. Holly, secretary; A. J. Williams, treasurer. Executive Committee: W. W. Roberts, James M. Wilson, J. L. Brush, Alfred Butters and George W. Brown.

schedule of rates of reimbursement was fixed at two-thirds the prevailing market value of the cattle.¹⁴ In time the railroads fenced their rights-of-way, as was later required by law and demanded by the traveling public, who objected to frequent delays while the train crew went forward to chase cattle or sheep from the track.

One of the first accomplishments of the Colorado Stock Growers Association was to obtain the passage of a law providing that no Texas or Mexican bull should be allowed to run on the range except in the counties of Huerfano, Las Animas, Costilla and Conejos. These exceptions were made at the request of the Spanish-American members of the Territorial Legislature.

Joseph L. Bailey, who figured so prominently in the association during its early days, was a fifty-niner, who gave up gold digging to engage in the meat business on Blake Street, Denver, buying a shop on credit and clearing over \$30,000 in eighteen months through the sale of meat to arriving emigrants and provisioning parties of prospectors for the hills. In 1865 he opened the Bull's Head corral, which was a market for livestock and the true forerunner of the Denver Union Stock Yards. (The Bull's Head Corral at G and Wazee Streets, was operated by G. W. Snell as early as June, 1861, but not as a market place.) He handled the bulk of the hay that came to the Denver market, his trade in that commodity reaching four thousand tons in one season. Occasionally a load of baled hay brought \$500 to \$1,000 in the mining camps, and hay could be had for the cutting in every swale or valley.

By the time of the second annual meeting of the Colorado Stock Growers Association, February 1, 1873, the cattle population of the state had jumped from 142,178 in

¹⁴ This schedule was as follows: Texas yearlings, \$7; two-year-olds, \$12; cows, three years old and over, \$16; American yearlings, \$12; two-year-olds, \$22; three years and over, \$30; American work cattle, \$37.50; American sheep, \$2.50 each; Mexican sheep, \$1.50 each. There came a time in the history of the industry when this rate of repayment made it more profitable for the stock raiser to sacrifice his cattle or sheep to the railroad than on the market, and when there was little regret by the owner if an engineer carelessly ran into a herd.

1871 to 242,372. Sheep were listed in 1871 at 184,577 and in 1872 at 266,015. These were assessor's figures, the actual number being much in excess of that given for taxation.

Three breeding farms were established during 1872 and eighty-seven pedigreed Shorthorn, Devon, Jersey, Hereford and Galloway bulls had been brought into the State, Shorthorns predominating. Sheep improvement was indicated by the importation of 456 Merino, Southdown and Leicester bucks. These figures were given in the annual report of Secretary Holly. Captain Joseph S. Maynard was chosen director for Colorado in the American Shorthorn Breeders Association. The pioneer committee on purebred sires, appointed at this second session, was composed of Capt. Maynard, W. Scott and J. W. Chatfield. This committee reported about 300 head of herdbook cattle in the state.

DAYS OF THE OPEN RANGE

Ten years after the first herd had been driven to the railroad at Abilene the range cattle industry was at the height of its picturesque glory and nearing the period of opulence that drew the eyes of the world on Colorado and brought to it millions of British capital that lay locked in European vaults for want of an industrial outlet in the Old World. Individual ownership was still the rule; herds had been multiplying until there seemed hardly room on the range for more cattle. Grass was becoming scarce, the water courses and adjacent hinterland had been appropriated. These were the days of the uncounted herds. Owners did not know how many head they had and assessors could only guess at the totals.

Texas steers were always unruly. They were accustomed to men on horseback and when approached afoot there was alarm and flight. If the herder of those days was "wild" it may be ascribed to the nature of his occupation and that of the animals he had to subdue, for they were equally wild. Herding was anything but a peaceful pastoral pursuit, especially at the round-up, when the cattle were brought in for branding, sorting out marketable animals and shipping. The cowboy, the cow pony and the Texas steer were three of a kind, each in his place suited to the part played in the business of converting grass into beef.

The bronco, as the Spanish term for the cow pony indicates, was "rough"—a descendant of the horses brought to America from Spain by the conquistadores, reverting to wildness, recaptured and tamed for use in riding herd by the American settlers of the Southwest. The bronco was of the same stock as the Indian's cayuse, though more civilized by bridle, bit and saddle. He had wonderful stamina and as a runner held his own with the Kentucky Thoroughbred and was capable of being highly trained for the business of herding. Perfect coöperation between cowboy and cow pony was usual in the round-up or on the trail, the wiry, intelligent animal sensing the will of the rider instantly and bringing up with a jerk when the lariat was thrown over the horns of a steer.

Branding the new crop of calves or rebranding, when changes of ownership made it necessary, was a lively operation. Searing the brand of ownership on the hip or side of an animal is an ancient practice, probably as old as the use of the hot iron for branding slaves, or as a method of identification of criminals. The Spaniards brought their branding irons from Europe. The practice was in vogue in southwestern America with the rise of the cattle industry and is still the method used on western ranges, although it reduces the value of the hides for leather. It persists because there seems no other way of permanently and visibly marking cattle so that a rider on the round-up can readily pick any brand out of the herd.

When herds multiplied with the sudden rise of the range industry in Colorado, great confusion of brands resulted. Some form of registration and systematic marking had to be devised. At first registration of brands was conducted by counties, but later legislation was enacted providing for state registration. Still there were numerous duplications and county lines were of no effect, because of the wide area over which the herds ranged.

The Colorado brand book, in which all brands were registered and illustrated, at one time reached such bulk that copies cost stockmen nine dollars each. Even at that figure, the volume, while serviceable to a degree, only emphasized the fact that there existed an unwieldy conglomeration of marks which cried aloud for system and

order. Finally order was brought out of chaos by W. C. Baker, for years secretary of the State Livestock Inspection Board, who devised a system of brands, based on the alphabet, numerals, and geometric figures in orderly arrangement. Under Baker's plan, the books were printed by a special photographic process and on a grade of paper that produced a handy volume, selling for a nominal sum. The system permits of almost endless combinations and variations of letters, numerals and signs, so that new brands may be added indefinitely without the necessity of eliminating those no longer in use. The Colorado brand book for 1920 contains nearly forty thousand brands, and lists over thirty thousand cattle and sheep owners. The Baker system of registration was later adopted by all western range states.

Texas cattle came from Spanish foundation stock, their native home being the Andalusian plain. Three centuries of rustling in Mexico had not improved them. They were as unlike American and English bred beef cattle as though a separate species. They were light bodied, long legged, thin, with elongated heads, narrow muzzles, widespreading curved horns, measuring five feet or more between tips. There was little resemblance to the blocky type of short-legged English and Scotch cattle upon which Colorado ranchmen had begun to build in a limited way when the drives began. What was lacking in type and conformation was emphasized also in the quality of beef, Texas and tough being synonymous.

Better bred beef stock could hardly have survived the wild conditions under which Longhorns were raised in Texas. Mild winters and good grass with excellent water were only half the story. Protracted drouths and extremes of temperature were frequent in Texas, then as now, and distressing alike to man and beast. These very conditions fixed the hardy type and precluded the possibility of prime beef, such as comes from the soft-fleshed, fat cattle of the British breeds. That the Texans improved on Colorado grass is true as to weight and finish, but the finest grass could not alter a physical structure that was the result of centuries of natural selection in a harsh environment.

In acquiring pasture lands, it was customary to file on

or purchase quarter sections of land fronting on water courses, so that actual ownership might extend only a fourth of a mile, which would be sufficient to control the backland, because the grass was useless without water and the general opinion was that, without irrigation, no crops could be grown. Once having acquired considerable water frontage, the adjacent open range could be appropriated without formality of law, but with the sanction of custom and tacit consent of the community, which found in cattle or sheep raising its chief industrial asset.

Due to this freedom from legal restraint and the general belief that the country was fit only for grazing, there developed an attitude of *laissez faire* on the part of the public that led to the industry virtually making its own laws, which, though first unwritten, were nevertheless fairly well observed and later became incorporated in the statutes of Colorado. That abuse of the range privilege crept in was only natural. Still, the basis for this system of self-government was a desire for harmony between men engaged in a common calling, who, though competitors as individuals, realized the necessity for unity of action as an industry. Their associations carried out this thought to the ultimate in self-imposed usage and regulation, respecting each other's rights on the open range and standing together against thievery, alteration of brands, mavericking and other forms of outlawry more effectively perhaps than if regulatory measures had originated with the government. While many violations were charged to stockmen, the offenders were the crooks to whom any business is a temptation that offers easy opportunities for swindling under circumstances that make discovery difficult.

There was hardly a semblance of government over the vast areas of prairie and mountain lands when the first drovers came, and even after stable government had been established, the grazing country was still without effective supervision, because it was not settled and it seemed valueless except for pasture. After the range was occupied, a measure of self-government was established and when controversies arose, such as the trouble between sheepmen and cattlemen, it was natural that the range users should attempt to settle it among themselves. While the feudal

lords of the range had no vassals, they were in possession of the land and they looked with disfavor on interference with their grass and water.

For many years after the first settlement, the fable of the "Great American Desert" persisted among those who occupied the territory. They did nothing to expose the myth and everything to perpetuate it. It was easy to believe, by people who had been accustomed to agriculture under sub-humid conditions, that farming without irrigation in an arid climate was impossible. There was hostility toward the settlers who homesteaded with the intention of making a living on a quarter or a half section of land. Looking back in later years, it was realized that mistakes had been made on both sides. Careful classification of lands in the beginning would have saved for pasture many rough or sandy areas that have never become profitable for general farming, but have long since been lost to the grazier.

Before the homesteading movement got well under way, efforts were made to have the plains region set apart for perpetual use of the livestock industry. In 1876 the commissioner of the General Land Office, in his report to the Secretary of the Interior, urged that the public domain west of the 100th meridian and east of the Sierra Nevada Mountains should not be surveyed in minute subdivisions "except only small portions which are susceptible of cultivation without artificial irrigation." He recommended that the "barren lands" be thrown open to purchasers in tracts of unlimited size "as they are worthless without irrigation, which cannot profitably be undertaken for small areas of 160 acres each."

This recommendation found favor in Washington, President Hayes in his message to Congress under date of December 3, 1877, saying: "These lands are practically unsalable under existing laws and the suggestion is worthy of consideration that a system of leasehold tenure would make them a source of profit to the United States, while at the same time legalizing the business of cattle raising which is at present carried on upon them."

Backing up the President's recommendation came action by the Colorado Stock Growers Association at its January meeting, 1878, memorializing Congress to set aside "the

vast region of country which, owing to climate and lack of rainfall, is unsuitable for any but pastoral purposes" and lease or sell the lands for a nominal sum.

Had the recommendation prevailed, there would be a different story to tell of the West's development. The 100th meridian, designated as the dividing line west of which all unirrigated upland was merely pasture, passes through Dodge City, Kansas. The western border of this vast empire of grassland, the Sierra Nevada range, lies over the line in California. Between, there is a thousand mile stretch of country running the breadth of the national realm from Texas to Canada and including in Colorado alone what has since been developed under dry farming methods, an area of twelve million acres. To all of this was applied the sweeping classification of "worthless" by the commissioner of the General Land Office in the first year of statehood.

That stockmen believed themselves secure in possession of the range was brought out in litigation in which the United States Circuit Court returned a verdict in favor of the plaintiff, an English company, for \$500,000, the defendant being a Colorado cattle company.¹⁵ The court records show that the English company bought from the Colorado company a ranch in eastern Colorado described as "150 by 120 miles of free range and exclusive right thereto, three thousand acres of freehold pasture, nine miles of river front and tributary streams and nine thousand head of graded cattle." The suit arose over alleged false representations regarding extent of the defendant's possessions.

In 1877 the cattle population of Colorado was concentrated on the plains area, comparatively few herds having been started in the mountains. The estimated value of cattle turnover for the year was \$2,233,200. The year's wool clip of five million pounds was valued at seventeen cents a pound, a total of about \$900,000. These figures tell the fiscal value of the industry near the close of the first period of development and just before English and Scotch capital became interested.

Fascinating stories of Colorado ranch life were appearing in the great newspapers and in the eastern magazines.

¹⁵ New United States Cattle Company vs. William J. Wilson.

Writers of ability came to the state to visit the ranchos, interview rancheros, and get firsthand information and local color on the life of the western cowboy and the romance of the cattle business. Vivid tales were published and the road to wealth via the picturesque prairie was so alluringly marked that promotion was stimulated, though even the plain truth would have been sufficient to interest capital.

"The Cattle King of Colorado" was the title conferred upon John W. Iliff, in his day the largest individual operator in beef on the Colorado range. Iliff crossed the plains in 1859, following the lure of gold that took so many young men from the farms and cities of the older states. His own story of how he left home in Ohio was that, after completing his education at Delaware College, his father offered to invest \$7,500 in a good Ohio farm for him if he would stay. "No," said Iliff, "give me \$500 and let me go west."¹⁶

He engaged in business at Denver and in 1861 invested in a small herd of cattle. His first big deal came to public attention in 1868, when he contracted to supply beef to the construction camps and the troops that guarded them along the line of the Pacific Railway, which was advancing westward from Nebraska into Wyoming. He placed an order one day in June, 1868, for \$45,000 worth of cattle, purchased in Southern Colorado, for cash. They were driven to his pastures along the Platte, where he had started development of the series of ranches that gave him control finally of most of the water over the immense area from Greeley to Julesburg.

A report made on his holdings in 1877 indicated that, while he owned only about 15,000 acres in nine ranches, he controlled 650,000 acres of open range through ownership of water front. The ranches were stocked with 35,000 head, including 6,000 to 7,000 breeding cows. He was using only high grade Shorthorn bulls. In summer he was in the habit of buying from 10,000 to 15,000 Texas steers coming two and three-year-olds, grazing them one or two seasons and shipping out in fall, along with three and four-year-old steers of his own breeding. The Texans weighed from six

¹⁶ [W. B. Vickers], *History of Denver* (1880), 475.

hundred to eight hundred pounds when taken from the trail and cost \$11 to \$15 a head. They averaged around a thousand pounds when sold, bringing \$30 to \$37. Iliff's own steers weighed eleven to twelve hundred pounds when sold and brought from \$38 to \$50. He employed about forty men during the summer and a dozen or fifteen for the winter, paying them \$25 to \$30 a month and board. Two hundred horses were used on the ranches, these coming mainly from Texas with the trail herds.

Iliff died in 1878 in the prime of life, when his business had grown to gigantic proportions, that gave reason for conferring upon him the title of "cattle king."

While John W. Iliff was rated the largest individual beef producer in the state, the corporation that lived longest, handled the greatest number of cattle and controlled the largest acreage was the Prairie Cattle Company. It is doubtful whether any other corporation on either American continent ever approached it in numbers of cattle marketed when the full period of its existence is considered. The Prairie Cattle Company was organized under the laws of Great Britain in 1881 and dissolved by voluntary action of its directors in 1915.

The property lay in three divisions, the Colorado holdings comprising 2,240,000 acres and embracing a territory of 3,500 square miles. On this range in the eighties there were nearly 54,000 cattle, in the management of which three hundred horses were used. The range extended east and south of the Purgatory and Arkansas rivers to the Cimarron, this being the old "JJ" range, that brand having furnished probably more cattle to the Kansas City market than any other single brand used on the western range. "JJ" was from Jim Jones, head of the Jones Brothers outfit, whose herd formed the nucleus of the Colorado holdings of the Prairie Cattle Company and fixed the price which the Scotch corporation paid the various smaller ranchmen whom they bought out when they started operations in 1881.

Two other ranches were owned and operated by the company, one being in northeast New Mexico and overlapping into the Oklahoma Panhandle and known as the Croselle. This division embraced 2,580,480 acres, and was

stocked with about 58,000 cattle. The third division comprised principally the "LIT" Ranch, with headquarters at Tascosa, Texas. The area was 256,000 acres, with about 30,000 cattle.

From information given by officers of the company to Baron Von Richtofen in 1883 it was estimated the value of the property was \$4,416,484. Operations were begun with 104,000 head and in two years this number had been increased to 139,000, while dividends had been drawn and all expenses of operation paid, leaving a net profit of about \$50,000 in 1881 and \$250,000 in 1882.¹⁷

According to the same authority 26,000 calves were branded by the company in 1882. The three ranches were even then connected by a private telephone line, while other large ranches relied on the telegraph for quick inter-communication.

When the Prairie Cattle Company bought the "JJ" herd, it had already been improved with Shorthorn blood. The Croselle too, had been using Shorthorn bulls but later changed to Herefords. The "LIT" was stocked with Texas cattle, but the new owners began improvement with pure-bred Hereford sires.

The London Economist in March, 1884, reviewing operations of British-controlled cattle companies, stated that the Prairie Cattle Company, the year previous, had paid a dividend of 20½ per cent, the Texas Land and Cattle Company, 12½ per cent, the Matador Company, 8 per cent and the Arkansas Valley Cattle Company, 10 per cent. There were other large companies that took rank with the British-owned corporations in numbers of cattle turned off. Pryor Brothers, Pueblo, placed the largest order for Texas cattle in 1884, contracting for 45,000 head to be driven to Colorado over the trail. F. P. Ernest the same year brought in between eight thousand and ten thousand for his ranches on the Republican and at Deer Trail; Shepherd and Scherrer contracted for six thousand for their Republican River range; Henry Gebhardt brought in five thousand head and the Arapahoe Land and Cattle Company, ten thousand Texas steers, all trailed in from the Southeast.

¹⁷ W. B. Von Richtofen, *Cattle Raising on the Plains*.

By the middle eighties the way of the trail drover had become increasingly difficult. Already beset with natural obstacles, the trail was now subjected to interference by settlers. So acute had the situation become that stockmen at a national meeting in St. Louis in 1884, authorized preparation of a memorial to Congress, asking the Federal government to establish a trail from the Red River to the Canadian border, utilizing government land and acquiring intervening right-of-way by purchase, the trail to be from five to fifty miles wide, fenced, streams bridged and shipping points to be established at convenient intersections with branch trails and railroads. The proposal did not get beyond the stage of introduction in Congress, because of rapidly increasing railroad facilities and extensions connecting the breeding grounds in Texas with the range country.

An estimate, made in 1884, was that from 1866 to the close of 1883, 4,707,976 head had been driven north from Texas to Colorado and beyond.¹⁸

Up to that time the public thought had become somewhat confirmed in the idea that the range industry was a bonanza business, though it had already been hard hit by occasional severe winters. Losses were expected as incidental to the business. There was some clamor for more humane treatment of stock, but the rangeman's answer was that nature had provided the open prairie for just such use; that buffalo and antelope had weathered the storms of centuries, with the penalties that wild life has to pay, and that domestic cattle and sheep must become inured to the same hardships, else the world would go hungry for beef, and half clothed for lack of wool. Proponents of the industry had the figures to show that a beef and wool shortage existed. The grass was at hand to support the herds. Its value to Colorado for one season was estimated at thirty million dollars and as one contemporary writer put the matter: "On it will feed and fatten 1,500,000 head of horned cattle, 2,000,000 sheep and goats and 500,000 horses and mules."¹⁹

The other side of the story was brought out in 1886 by

¹⁸ *Colorado Live Stock Record*, April 18, 1884.

¹⁹ *Ibid.*, May 4, 1884.

Field and Farm, whose editor, Lucius M. Wilcox, said: "For three years past the men who bought Texas cattle have lost money. Fifty thousand made food for the buzzards last winter. Had no cattle come up from Texas in 1885, Colorado would have been two millions better off today than it is. To sum this business up in a nutshell; every herd that crosses our southern border from Texas is a detriment to the state. They eat the grass that better cattle should eat, and poison that which they do not eat and, after being paid for in good Colorado money, they seem to delight in wrapping their mangy hides about them and lying down to die."

This reflected the feeling of some far-seeing men who had always maintained hostility toward the Longhorns, and who upheld the viewpoint of the early comers when they procured legislation from the territory in its infancy, seeking to close the range to the drovers from the Lone Star State. This viewpoint did not win then; it did not prevail in the middle eighties and it was not accepted until the lean years of over-grazing and the invasion of the homesteader forced the conclusion that the traffic in Texas cattle was unprofitable in the long run.

According to Colonel I. T. Pryor of Texas, who operated for years in that state and Colorado, the drovers had a margin of \$3 to \$4 a head in the palmy days of the industry. In 1884, according to Colonel Pryor, quoted in *The Trail Drivers of Texas*, he paid \$12 for yearlings, \$16 for two-year-olds and \$20 for three-year-olds on the range in Texas, and he contracted to deliver these cattle to rangemen in Colorado and other western states at \$4 a head above cost. He sent fifteen droves northwest that year, 45,000 head in all. Eleven men went with each herd of 3,000, the outlay for wages being \$400, and for provisions \$100, cowboys getting \$30 a month and the foreman \$100. The length of the drives averaged 450 to 500 miles and the total cost for the fifteen drives was \$7,500. Colonel Pryor's estimate is that at present-day freight rates this movement would have cost \$25,000 to \$30,000. The loss in trailing that year was only three per cent, or about 1,500 head, out of the season's total of 45,000.

While the Texas drover found the business profitable, the Colorado rangeman's end of it was not always gainful.

Some men made money handling Texas steers, and some laid the foundations for fortunes, built up later by rising land values or banking and merchandising operations, but averaging up Colorado's part in the Texas cattle trade, the final verdict is: unprofitable and unsatisfactory. And yet, Colorado had the grass and Texas was the only source of supply in quantity, of the type of cattle that would show gain in weight and money under the rigors of the western range.

Just as the buffalo has become almost extinct, living today only in a few protected herds, with no probability of ever again being more than a zoological curiosity, so the Texas Longhorn has vanished from the United States. Few were seen in Colorado after 1890. They had been displaced by better cattle, the process of elimination and crossing going on both on the Texas breeding grounds and in Colorado, though here the great bulk of them were double-wintered on grass and sent on for slaughter. They are still found in some parts of Mexico and South America, but as long ago as thirty years their horns had become worth many times more than the live animals. Fifteen to eighteen dollars was a good price for a Texas steer, but many a pair of horns has been sold for two hundred dollars and they gain in worth as antiquities do with remoteness from the period when they were commonplace. Even without other disqualifications, the horns were sufficient to make the Texas steer an economic anomaly after railroad transportation superseded trailing. Half the car space could be saved by shipping cattle with horns of normal type.

The range producer had constantly to face winter losses which sometimes took a third of the cattle. Out of twelve thousand head Iliff one winter lost only six hundred; James Bailey the same winter, however, reporting his losses forty per cent of the herd. Farwell Brothers also lost heavily that winter, reporting thirty-five per cent of their cattle killed. These were Weld County herds; some others in the same county who had better natural shelter reported light losses. For example, J. L. Brush, five per cent, Bruce Johnson and George Briggs each six per cent. Sheep often suffered more than cattle, James Morse on the Platte in Weld County having lost four thousand out of eight thousand head in an April blizzard. As one writer of the day

aptly phrased it: "Death stalked the plains and filled the gulches with carrion."

In the spring of 1886 quarantine against Texas cattle became effective and Colorado, combining with Montana, stationed an inspector on the Cimarron River, where it cuts the southeast corner of the state. It was the inspector's duty to see that no cattle originating below the quarantine line in Texas were admitted, unless they had been held ninety days north of the 36th parallel of latitude. Dr. George H. Glover was the inspector for the two states during three years. In his first year he inspected 242,000 head, mostly destined for Montana and the Dakotas. These cattle were following what was known as the National Trail, which wound along within the eastern border of Colorado from the Cimarron to the Platte, crossing the Arkansas at Trail City (near Holly) the cow town that succeeded Dodge City as trailing was forced gradually westward.

Inspection consisted in the examination of sworn statements covering ownership of brands and certifying that if the cattle originated below the quarantine line, they had been held the required period north of 36 to insure their immunity to Texas or splenic fever. At that time Longhorns still constituted the great bulk of the movement from south Texas, although they had been supplanted largely by better cattle north of the quarantine line. Herds in the Texas Panhandle and in most of the Indian Territory had been bred up on native American stock till there was little trace of the old Spanish strain.

Quarantine regulations were enforced through the office of State Veterinarian, created by the fifth General Assembly in 1885, which also provided for creation of the State Veterinary Sanitary Board. This Board went through various political changes until 1903, when it was incorporated in the Stock Inspection Board, composed of nine stockmen. Dr. Charles G. Lamb has served as State Veterinarian twenty-five years.

During the period of sanitary supervision of the range industry the greatest achievement was the discovery by Dr. Cooper Curtice of the United States Bureau of Animal Industry that the cattle tick was responsible for Texas fever and that eradication of the tick meant suppression

of the scourge which had turned the hand of every friend of good cattle against the Texas steer. While that uncouth creature was himself immune to fever, his hide was often literally covered with the blood-sucking, disease-spreading mites that contaminated grass and water and worked havoc in the herds of better bred cattle on western ranges.

Discovery of the cause resulted in effective prevention of splenic fever, the last serious outbreak in Colorado occurring in the Platte Valley near Sterling in 1891. Blackleg, another scourge that oftentimes wiped out calf herds on the range, is now controlled by the general use of aggressin, a preventive serum. Other diseases less virulent, but nevertheless requiring constant watchfulness, that are still serious factors in livestock losses, are mange, or scab, among cattle and sheep and bovine tuberculosis, which occurs mostly in dairy herds. Glanders in horses, once quite prevalent, has ceased to be a problem.

These changes, bettering health and sanitary conditions in the range industry, have been due to the progress of veterinary science and the coöperation of the stockmen with the State Stock Inspection Board, an official body whose members serve the industry without salary, receiving only their necessary traveling expenses in attending meetings.

Aside from the menace of disease, the rangeman has predatory wild animals and poison weeds to contend with. Mountain lions and wolves attack lambs and calves and the United States Biological Survey constantly has hunters employed to protect herds and flocks by ridding the range of these animals. Poison weed eradication is an activity of the Forest Service, directed particularly at larkspur, which is fatal to cattle when the plant is in its early stages of growth, but does not affect sheep. Prairie dogs and gophers also are destructive of pasture lands and are fought continuously by both state and federal agencies coöperating with the associations of stockmen.

THE SHEEP INDUSTRY

While the early Mexican farmers in Southern Colorado had flocks of sheep and the industry among the people of Spanish descent is as old as the settlements, Americans



SHEEP ON COLORADO RANGE, 1925

On ranch of Kenneth Chalmers, Hoosier Pass, South Park

were slow to take up this branch of farm husbandry. The first flock of considerable size was that of Lafayette Head, driven into Conejos County from the Taos country in New Mexico in the middle sixties. This flock consisted of about one thousand native sheep of very poor grade, shearing about two and one-half pounds of wool per head. "Zan" (Alexander) Hickland followed soon after with a flock which he kept on the Greenhorn Range south of Pueblo.

The first flock of fine woolled Merinos was brought in by Captain J. S. Maynard, who also had been a pioneer in purebred Shorthorn cattle importations, to his Meadow Springs Ranch in Weld County. He bought the sheep in Canada and Illinois, shipped them to Cheyenne in 1869 over the newly completed Pacific Railway and drove them to his ranch near Carr. Another shipment coming in the same way was owned by Harvey D. Ring and went to El Paso County, giving the sheep industry in that region a start.

From 1870 to 1880 sheep raising developed slowly, but beginning with the latter year, progress was rapid. In 1880 the count of range sheep in Colorado was about 110,000; in 1886 this had increased to two million. The average clip in the early years was under four pounds but by the middle eighties it had come up to seven pounds. The total wool clip for 1885 was about 8,000,000 pounds and late in the season quotations for staple at shipping points were fifteen to eighteen cents. The value of the investment in sheep and property devoted to that industry in 1886 was \$4,500,000.

Wool was of inferior grade, as the foundation stock was principally Mexican, inured to climatic hardships of scant grass and poor water after centuries of roughing in the southwestern region. These sheep, like the Texas Longhorns, were a survival of Spanish importations, without renewal of blood, though the progenitors were of good wool-producing strain. Purebred rams were introduced by American flockmasters, but improvement was hardly perceptible, nor could much be expected in the short period which these flockmasters allowed themselves for building up what they called a money-making flock.

Trouble between cattle and sheep raisers cropped out almost immediately with expansion of the sheep industry

after the railroads were completed to the Rocky Mountains and quick transportation to market provided an outlet for wool. Like the cattle industry, sheep raising was attractive because of the low cost of range stock and the fact that the expense of herding was trifling and grass and water were free. The sheep raiser had as clear a right to appropriate the grass as the cattleman, but the test of control, sanctioned by custom, was priority of possession. If cattle were there first and a sheep herder came in there was trouble. The argument is not altogether unfavorable to the cattle raiser's side. Sheep crop the grass closely and tramp down what they have eaten off, leaving the ground practically bare. On what the cattleman would call good grass, sheep were ruinous, while on rocky or sparsely grassed areas they could subsist and not interfere with cattle. This naturally relegated them to the higher mountain areas, or to foothills where timber was thin and the grass unattractive to cattle. This distinction was not made by the owner of the sheep, though it was observed later when large operators became engaged in both lines of production and found it quite possible to separate the two classes on the basis of differences in pasture conditions.

Brutality that admits of neither apology nor excuse was ascribed to cattlemen in the war to keep sheep out of certain areas. At first the organizations of rangemen made no distinction between cattle and sheep growers, admitting both to membership, but it soon developed that the two classes were antagonistic and the sheepmen withdrew and formed an association of their own. Both associations officially deprecated strife and at their annual meetings constant reference was made to the subject, cattlemen insisting that raids on sheep camps were made on individual responsibility and against the counsel of the organization. Rewards were offered for perpetrators of outrages, but it is not of record that any were arrested for running sheep out of the country. There was usually an undercurrent of sympathy for the aggressors, sometimes an outspoken and nearly always a covert antagonism toward the sheepman. It was a state of mind arising from public sentiment in the cattle country which, however ugly and unjust, is not to be ignored in recording events of the range industry.

Examples could be multiplied, but one will suffice to indicate the character of the attacks made on flocks which were usually in the charge of Mexican herders. One morning in March, 1877, at the White Ranch, six miles east of Pueblo, a sheep herder who had left his flock of 1,600 safely corralled at night, found between seven and eight hundred dead by poisoning when he returned to the corral. Other hundreds of the flock had been clubbed to death or their throats cut and otherwise mutilated. The few left alive were crippled. The sheep belonged to Bartels Brothers at Pueblo. Bran, poisoned with strychnine had been fed to the flock. A reward of \$3,000 was offered for arrest of the perpetrators, one-third of this by the owners, one-third by the Colorado Sheep Growers Association and the balance by the State, through Governor Routt. The reward was never claimed. Such incidents were of frequent occurrence over a thirty-year period and sometimes they ended in bloodshed, many a life having been lost in the quarrel over range "rights." "Deep regret" was always expressed in the resolutions, but these expressions could not solve the problem and there was no solution until the so-called rights had been legally established and the range came under official supervision, as is the case on the National Forests. Strife was inevitable under the free range system.

Though natural conditions for sheep raising in the mountains of Colorado are ideal, the industry has met many obstacles aside from opposition of the cattle raiser. After a comparatively flush period of twenty years, 1893 brought demoralization, through economic factors over which the sheep raiser had no control. One factor was the general depression which was nation-wide that year, but hit Colorado particularly hard because of the decline in silver, and the other was an effort at Washington to put wool on the free list. The western sheep raiser's predicament was set forth in that year by a statement from Francis E. Warren of Wyoming who was operating both sheep and cattle ranches and who acted as spokesman for the sheep industry because he had been in the United States Senate, though at that particular time he was back in private life. He called attention to a reduction of 40 to 60 per cent in sheep values and insisted that the removal of all duty on wool

would throw 750,000 men out of employment or business, and inflict on the nation an agricultural and industrial loss of \$200,000,000. Market reports at that time showed western sheep selling at Chicago at \$1 to \$2 a hundred pounds, the producer losing a dollar a head on every animal marketed. Entire bands on the Western range were being sacrificed at \$1.25 to \$1.50 a head, prices that matched the figures at which Colorado ranchmen had purchased their foundation herds from the Mexicans twenty-five years before. There were more sheep on the Eastern Colorado plains than in the mountains in 1893 and many banks and mercantile establishments were sustained largely by cash from the wool clip. Wool was stagnant, a condition that seemed to be world wide, for Colorado sheep raisers were told to get what comfort they could out of the fact that Australian sheepmen were skinning sheep carcasses and selling the pelts, neither the meat nor the sheared wool being salable, while live animals were bringing fifty cents a head.

"Despised and rejected of men" might well be applied to the flockmaster in the realm of the cattlemen; neglected and scoffed at in the market place, scorned by statesmen; and yet, the honest product of the sheep's back was sought after then as in ancient days when the shepherd's calling was not considered a reproach.

If in these periods of depression the industry reached bottom, so again there were other years when wool was as precious as silk and the flockmaster became the envy of even the cattle drover. It was in these flush times that men decided to take a double shot at wealth and many have succeeded with cattle and sheep where there was ample range and the herds and flocks could be pastured apart. The recent big advance in sheep came in 1924 when seven million dollars was added to the value of the industry in Colorado.

When irrigation farming reached its high stage of development through the coming of the sugar beet industry, an era that began in 1899, both classes of range producers benefited, for it opened to them a new market at home for the products of the herds and flocks. Lamb and steer fattening became important operations on the irrigated farms which produce a million and a half tons of alfalfa

a year, while the sugar factories supply a million tons of beet pulp to fatten the steers and lambs grown on the range.

Lamb fattening as an industry in Colorado had its inception in a blizzard that overtook a shipment of 2,400 lambs from the New Mexico range in the fall of 1889. The shippers were Bennett Brothers. The storm stopped the lambs at Walsenburg, tying up the railroad many days. When transportation was reopened the lambs were in such poor condition that, instead of sending them east for fattening, they were shipped to Fort Collins where alfalfa hay was plentiful at two dollars a ton. They were fed generously on the cheap hay, finished on corn and marketed at Chicago in 1890 at \$5 to \$6.40 per hundredweight, making a good profit for the feeders. From that beginning at Fort Collins, the feeding industry has grown until northern Colorado alone fattens nearly a million lambs a year, while other districts along the Platte and the Arkansas fatten several hundred thousand. Lamb feeding started ten years before sugar factory by-products became available. It has grown far beyond the supply of Colorado range sheep, New Mexico, Wyoming and Idaho being drawn on for lambs to fill the feedlots. While wool was at one time the sheep growers' main source of income, lambs now bring in the bulk of the revenue.

LIVESTOCK INDUSTRY ON AN ORGANIZED BASIS

An overstocked range, glutted markets, a sweeping tide of emigrants and an army of determined homesteaders filing on grassland that looked good for general farming without irrigation, had its effect on the range industry and by 1890 the bonanza days were over. If the years that followed lacked romance, it was none the less a lively period from rancour and reaction after the boom. Toward the close of the period came better prices for beef, a more settled feeling among those who carried on and results from the effort made to build up the herds on good blood. Both cattle and sheep growers had long been well organized locally and in state associations, inspection of cattle was a success, theft had been practically eliminated and the range had been crowded back more and more into the mountains,

while the industry as a whole had obtained a good business footing.

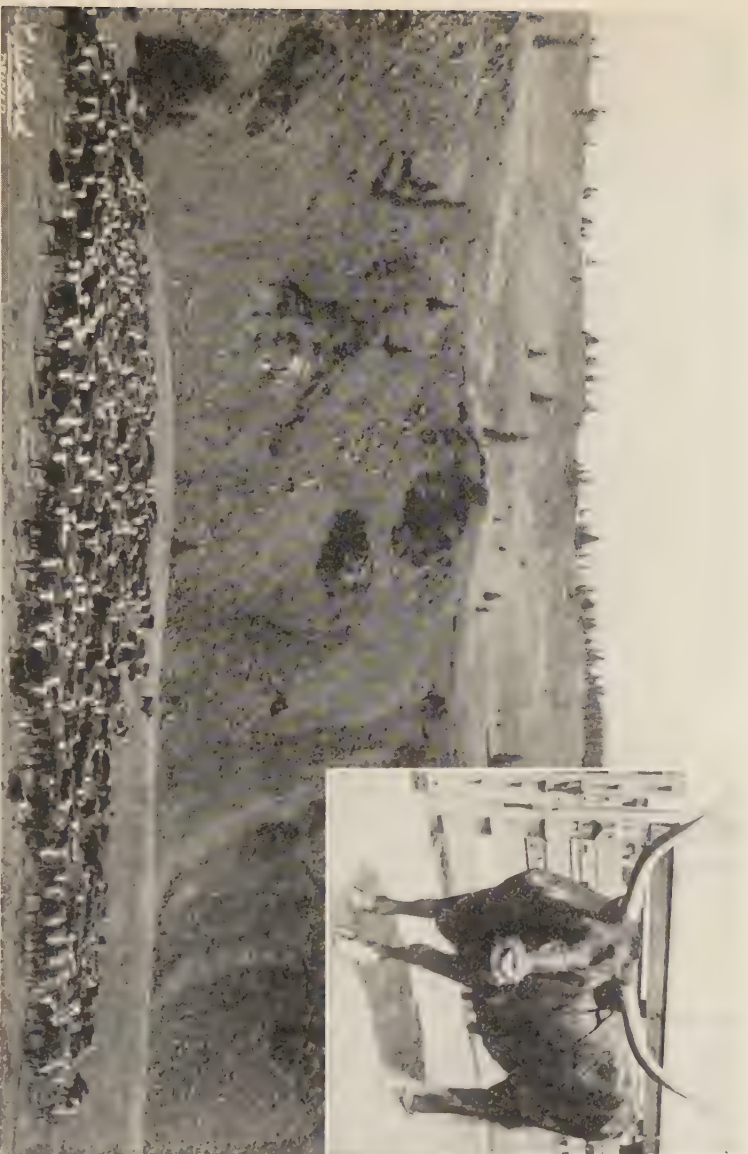
The need of national organization was apparent and Colorado took the initiative, because the state was in a position of leadership, if not in numbers of cattle on the range, decidedly so as to quality. The first annual meeting of the National Stock Growers Association, at which organization was perfected, was held at Coliseum Hall, Denver, January 25, 1898, nearly one thousand delegates being registered, from every state west of the Missouri River, with a few from eastern states. John W. Springer was made president, in which capacity he served six consecutive terms. F. J. Hagenbarth of Idaho succeeded him in 1904.

At the second annual meeting, also held in Denver, January 24, 1899, President Springer, in his annual address, said there were delegates present representing eight million head of livestock, valued at two hundred and fifty million dollars. When the association spoke Congress and western state legislatures took notice. Leasing of the public domain was one of the chief questions considered at the first few meetings and, while sentiment among the large operators was favorable, the small holders thought they saw in this movement an effort to crowd them off the range and they fought leasing, effectively blocking action.

Dissension came over various policies, a part of the membership withdrawing and joining the American Cattle Growers Association, which had been formed at Denver in 1901. Simultaneous with the meeting at which the American was formed, there was held in Denver a session of the Western Range Association, confined to Colorado stock raisers, representing four million head.²⁰

Differences between the American and National were

²⁰ The first officers of the American were: F. C. Lusk, California, president; Frank C. Goudy, Colorado, first vice president; M. K. Parsons, Utah, second vice president. The Range Association was officered by: W. L. Grubb, Garfield County, president; Conrad Shaefer, Morgan County, vice president; C. W. Bowles, Douglas County, secretary; T. S. Harter, Lincoln County, treasurer. The Range Association was made up of the smaller cattle growers, whose herds numbered from one thousand head down to one hundred or less.



(Courtesy the Dallas News)

HEREFORD CATTLE ON THE COLORADO RANGE (1925)

Insert: A Texas Longhorn, such as were common on the Colorado range forty years ago.

ironed out and, on January 20, 1906, a combination was formed, adopting the name American National Livestock Association. This organization is still in existence, having held its 29th annual convention at Phoenix, Arizona, January 13-15, 1926.²¹

Throughout the turbulent years of the range industry, the Colorado Stock Growers Association, now over half a century old, has served steadily and efficiently as the medium for voicing the demands of individual producers for improvement of the business, through legislation or other necessary action. In 1925 the state Association had on its membership rolls more than forty associations, besides hundreds of individual stock growers.²² While the divergence of purpose and interest that cropped out in the formative period of the National Association indicated a state of flux, it also forecast the end of large operations on free range. In March, 1901, an unnamed cattleman was quoted in the *Denver Record Stockman* thus: "For the past twenty years we have been destroying the grass on the range at an ever-increasing rate. We have been burning the candle at both ends, the settlers taking up the valleys and the water supply and the stockmen fighting each other for the grass on the hills. Ten days ago I passed over miles of desert which only a few years ago, I remember to be good grazing land. Today the grass is as utterly swept away as though it had never been. We used to destroy about a million acres a year in this way, but now we are spoiling range at the rate of six or seven million acres per annum.

²¹ Officers for the current year are: President, C. M. O'Donel, Bell Ranch, New Mexico; first vice president, L. C. Brite, Marfa, Texas; second vice presidents E. L. Burke, Omaha; H. G. Boice, Phoenix, Arizona; George Russell, Jr., Elko, Nevada; Hubbard Russell, Los Angeles; William Pollman, Baker, Oregon; attorney, H. S. Cowan; secretary, T. W. Tomlinson. The two last named have served continuously since the reorganization in 1906.

²² The officers in 1926 are: Harry J. Capps, Walsenburg, president; Richard Dillon, Sedalia, vice president; J. H. Neal, Denver, treasurer; B. F. Davis, Denver, secretary-manager. The board of control is composed of Frank Parsons, Weston; Field Bohart, Colorado Springs; C. T. Stevens, Gunnison; and Kenneth Chalmers, Garos.

Within two years at the outside the Government will be in absolute control of all public range, and sheepman and cattleman will dwell once more in unity, but with a fence between them."

He spoke prophetically. Already the United States forest reserves had been created and a new controversy had come apparently to increase the difficulties of the range user. It was not strange that the rank and file were unable to grasp the significance of the conservation movement, and it took ten years for regulation of grazing within forest boundaries to win complete confidence, though even yet there are outcroppings of strife, due to the method employed, or to the fees charged, and not to the principle of protection of the range.

Leading the opposition to federal control of grazing in the United States forests, was Elias M. Ammons, who was a state senator and later became governor of Colorado. He was a cattle raiser and a strong advocate of early maturity of beef, introducing the idea of finishing what is called "baby beef." He made a study of range grasses and grazing practices and it was in his capacity as a grazier that he ran counter to federal supervision, not because of any opposition to conservation of the grass, but because of the source from which control was being exercised. He was a firm believer in states' rights and his conception of representative government admitted no form of autocratic or bureaucratic administration. His contention was for laws by Congress to govern use of the forests instead of the established system of control by bureau, with a federal officer as final court of appeal. In that view Ammons had the support of a majority of range users, though finally federal control was accepted as inevitable.

Assumption of control by the government was justified by the argument that the natural resources of forest, grass and water had been and were being wasted by the states through political control, or lack of any control, and that because the issues were national and regional, rather than state-wide, federal authority was essential. Opposition to the Forest Service dwindled as range users and officials got on a basis of understanding and in later years animosity

practically ceased, though an occasional flare-up may still occur.

The National Forests of Colorado contain approximately ten million acres of grazing land, while another equal area is listed as grazing on the plains and in public domain outside of forest boundaries. The forest lands in 1924 supported 296,300 cattle and 860,600 sheep. The total beef cattle population of the state is around 1,000,000 head, which does not include cattle in feedlots. The sheep population exclusive of lambs on feed, was somewhat less than 1,000,000 head in 1925. Cattle use the forest range six months in the year, while sheep, pastured in the higher areas, have only a three-month pasture season. While large areas of the plains remain unfenced, the lands are either held in private ownership or are owned by the state, all being subject to lease and used largely for pasture by adjacent small land owners. The State has over two million acres of its lands under agricultural and grazing leases. The only free range remaining is on the public domain, which includes the unappropriated and unreserved government lands, comprising over seven million acres, of which possibly one-third are suitable for grazing.

Regulation of grazing was practicable only in the mountain region where government supervision could be applied. There was no one on the plains to save the grass from destruction, though that could have been done, under proper classification of lands and with systems of pasture rotation, such as a few stockmen have applied successfully, among them John Painter, of Roggen, long a leading figure in the American Hereford Cattle Breeders Association, former president of that body and for many years an officer of the Western Hereford Breeders Association. Painter witnessed the passing of the range on the plains, changed the character of his operations to meet new conditions and by application of the principles of range management, succeeded in bringing back to virgin vigor the native pastures on which his purebred animals now thrive. The Painter Ranch, comprising 30,000 acres of land in ownership and lease, is one of the few remaining large properties on the plains where grass and hay are the chief sustenance of

cattle, and these cattle are of a quality bringing fame to the herd wherever Herefords are known.

While the breeding of registered beef cattle is an industry distinct from that of running cattle on the range, the two lines are parallel to a certain degree. Without the open range the breeder would have had no large market for his bulls, and, bred under range conditions, the purebred cattle he disseminates are the product of environment and conditions insuring a hardy, indigenous offspring, fit to build up range herds.

With the ebbing of the Texas tide Colorado range producers took more thought for quality and, while a few had always been large purchasers of registered bulls from eastern breeders, they were now beginning to recognize the value of using sires, bred and grown under the favorable climatic influences of the high altitude of Colorado. As the range became more restricted, large herds were cut down and more attention could be given to breeding up both on farms and ranches.

Mention has already been made of the earliest advocate of Shorthorn cattle, Samuel Hartsel, who made no attempt, however, to disseminate good breeding stock, but was in the beef production business.

The first notice of registered Shorthorn cattle at the Agricultural Society's fairs came in September, 1869, when Colonel William F. Moeller made an exhibit of three Shorthorn bulls and one cow, the pedigrees of which were published in the newspapers. Moeller was a dealer, soliciting orders from Colorado ranchmen and making selections from herds in Kentucky. Whether these show animals were retained in Colorado is not known.

The first importer, breeder and disseminator of registered Shorthorns was Capt. J. S. Maynard of Meadow Springs Farm, near Carr in Weld County, who also brought in the first registered rams of which there is any record. Captain Maynard bought Shorthorns at the first consolidated blooded stock sale held in the United States. This sale was at the new Chicago Union Stock Yards in November, 1870. A few years later a part of these cattle were resold by Maynard to R. A. Southworth, who started a

breeding farm at Baldwinsville, twelve miles up the Platte from Denver.²³

In Southern Colorado Daniel W. Crane of Fremont County was a breeder of Shorthorns in 1871. His ranch was on Hardscrabble Creek and the herd was headed by Sir Henry, a bull brought from Kentucky. Crane had fifteen purebred animals and he was breeding up native cattle.

Herefords were exhibited at the same fair which directed attention to the registered Shorthorns, the exhibitor of whitefaces being G. H. Church. On May 3, 1869, *The Rocky Mountain News* mentioned that Church had "a fine herd of American cattle," including a number of purebred Herefords brought from Canada. The *News* urged him to bring these animals to the Agricultural Society fair that fall and Church did so.²⁴

Dissemination of Hereford blood began actively with the sale in 1873 of five registered bulls by T. L. Miller, the noted breeder of Beecher, Illinois, and he sold three of them to George Zweck of Longmont for \$1,250 and the other two went to the Powell Ranch near Cañon City for \$900. Miller went back to Illinois after more Herefords and sold them to P. P. Wilcox, George F. Lord, and others, the list of early Hereford owners in Colorado including Culver and Maloney of Big Thompson, the Church Ranch near Denver, W. E. James and Theodore White of Estes Park, J. W. Iliff, John H. Hittson and J. W. Prowers. A shipment of three-year-old Hereford steers went from grass on the Church Ranch to Buffalo, New York, in 1874, bringing seven cents a pound live weight; around ninety dollars a head.

As far as is known, J. W. Prowers, the "cattle king" of the Arkansas Valley, had the first Hereford breeding cows

²³ Maynard disposed of the last of his purebreds in 1877 to George Grant, an Englishman, who founded the Victoria Colony in western Kansas. Grant's purchase included fifteen bulls and several cows, all bred on Colorado soil, besides the herd heading sire, Sunrise (18415), who was bred in the East. The animals averaged \$400 at this sale.

²⁴ His exhibit included a bull, "Northern Prince," and three cows listed as "Indian Rose," "Nutty," and "Otsego." One of these cows was the daughter of "a celebrated bull, 'Berwick,' owned by Lord Berwick in England."

in Southern Colorado, having started a small herd in 1876 on his home ranch at Las Animas. The "LC" herd on the Baca Grant in the San Luis Valley, founded by George H. Adams, was established in 1880, with Herefords said to have been imported from England. However, the first calves from this herd in the American herd book were not recorded until 1890.

Other beef breeds are represented in Colorado by good blood lines, though Herefords and Shorthorns predominate, with the whitefaces far in the lead as to numbers of cattle on the range. The records of the American Hereford Cattle Breeders Association show 182 breeders of whitefaces in Colorado in 1926. The American Shorthorn Breeders Association records show 377 applications for pedigrees from Colorado for 1926, though there are 680 Shorthorn breeders listed in the State. The Shorthorns are widely distributed in small farm herds. Aberdeen-Angus and Galloway cattle are represented by a few herds and there are many of the dual-purpose Milking Shorthorn breed, popular because of their ability to produce both beef and milk.

Steer feeding had its beginning in the late seventies when the value of alfalfa became known, though it did not reach large proportions until the sugar industry was established. Unlike sheep, the number of marketable cattle produced on the range annually is greater than the feeders of Colorado can absorb, and thousands of head go to cornbelt feedlots or directly to the packers each fall. While these are marketed as grassfed cattle, they are carried through the winter on hay and not compelled, as in the early days, to subsist the year around on pasture. That was possible on the plains, but in the mountains snow covers the meadows half the year.

The final chapter in the story of the range livestock industry is still to be written, for areas in the Rocky Mountains suitable for grazing will be available as long as there are farm animals to utilize the grass. However, free range is a thing of the past. Regulation and conservation are a settled rule; pasture rotation is practised to some extent, areas being allowed to reseed by natural process, while the animals are pastured elsewhere. No one wants to return to the old days of free use and abuse of the grass.

Factors which have aided in the great economic changes in the industry include development of the central livestock market and packing houses at Denver, establishment of the National Western Stock Show with its educational influence for better livestock, the animal investigations work, experimental tests, veterinary research and scientific breeding and feeding of farm animals at the State Experiment Station. The combined influence of these educational and business forces, plus grazing conservation work of the United States Forest Service, has helped to shape the industry to meet modern conditions. Without these forces and their insistence on thrift and economy of management, there would be little left to say about grass and its sustenance of sheep and cattle in the mountains of Colorado. With them, it has been possible to salvage the remnant left by prodigal misuse of a natural resource and to again build up on nature's bounty with permanence for the remaining range users.

While the National Western Stock Show was not started until 1905, its fore-runner, the National Exhibition of Range Cattle, was held at Denver, January 24, 25 and 26, 1899. This was one of the few shows ever held in which only range cattle were exhibited. No breeding cattle were shown, the classifications being yearling and two-year-old steers, and calves, in two divisions—northern and southern. The show was an attraction arranged simultaneously with the second annual session of the National Livestock Association. Herefords took most of the awards; in fact, the charge was made that the judges were biased in favor of that breed.²⁵

No other exclusive range show was held in the state, but the Western Stock Show, as it was then called, formally opened its long career in January, 1905. The classification

²⁵ These judges were David Rankin of Tarkio, Mo., known in his time as the largest finisher of beef in the world; T. B. Hord, Central City, Neb., Peter Hopley, Atlantic, Ia., Tom Mortimer, Madison, Neb., Casper Beatman, Atlantic, Ia. Sweepstakes for best load of calves in either division went to Chambers and Whitney of Evans-ton, Wyo., while first prize for best load of Northern calves went to Newcomb & West of La Jara, Colo., their cattle being Polled Angus, the only blue ribbon herd in the show that was not of the Hereford breed.

lists of this show have from the start included feeder cattle, the commercial product of the range; bulls in carlots for range use, the show being unique in these two classes, with the largest feeder show held anywhere. Breeding cattle of beef and dairy classes, sheep, hogs, poultry in all classifications are a part of the exhibition, as at other great livestock shows. In late years the National Western has eclipsed the International show at Chicago in several classes, both in numbers exhibited and in quality. Judges of breeding cattle are chosen with reference to their international standing and, in all respects, the exhibition is of world-wide note in its relation to the livestock industry. Its foundation was and still is the grazing industry, other features having been added as the West developed in farm livestock, in intensive agriculture and in breeding practices.²⁶

E. M. Ammons was its first president and he retained that office until the year of his death, 1925, in recognition of his services in influencing the range industry, through persistent educational processes, to meet the new conditions. While he first publicly suggested and sponsored the show, the man behind him and who gave his utterances to the world, was the late Fred P. Johnson, founder and publisher of the Denver *Daily Record-Stockman*, which publication has had a large part in guiding the industry from the haphazard and wasteful methods of other days to the present economically sound and conservative business practices.²⁷

An impressive detail that emphasizes the difference between the old days of the range and the modern is the fact that one week's turnover in livestock which reaches its high point for the year during the National Western Show, runs

²⁶ The organizers of the show were: Jose P. Adams, Fred P. Johnson, William M. Springer, Harry Petrie, L. F. Twitchell, A. J. Campion, John H. Fesler, C. E. Stubbs, J. F. Vallery, E. Bosserman, Gordon Jones, W. L. Carlyle, John Grattan, I. N. Moberly, Clyde B. Stevens, E. M. Ammons, and F. W. Boot.

²⁷ The present officers of the Stock Show Association are: W. L. Petrikin, president; W. N. W. Blayney, first vice president; John E. Painter, second vice president; H. L. Youngerman, general manager; R. R. Boyce, secretary.

up approximately to eight million dollars, which is in excess of an entire year's business in the early period of the range industry.

The annual exhibition brings this development to public attention, but the market place witnesses the transactions. From Joe Bailey's Bull's Head corral in the early sixties to the Denver Union Stockyards of 1926 is a far cry, but the transition, however great, is easily traced. Bailey's market place was, what its name indicated, a stock yard where cattle were held for transfer to the butchers of Denver and the near-by mining camps. This yard was located on Wazee Street, between Sixteenth and Seventeenth, the present site of the Denver Union Station and terminal tracks. As the town grew other yards were built at Broadway and Cherry Creek, in the early seventies, and later they were crowded out to Thirty-fifth and Wazee streets, the present site of the Colorado Iron Works. This was the first place in Denver where cattle were unloaded directly from railroad cars into the yards.

Up to that time it was necessary to make a drive from the railroad yards with cattle that came to Denver by rail, as related by William Boot, who was a pioneer cowman in the Ute country on the Western Slope. Boot was the first to ship a load of cattle by rail over the Continental Divide at Marshall Pass, this being in 1873. He had to trail the cattle a hundred miles to Gunnison, coming from what is now Montrose County, Gunnison being then the terminus of the Marshall Pass line. On reaching Denver the cattle had to be unloaded at Burnham Junction and driven to the stock yard on Cherry Creek, at Broadway, where each shipper or drover sold his own cattle. Boot sold his load to Frank Aicher who had abattoirs and meat shops at Denver and Central City.

The next extension of city limits from Thirty-fifth Street forced the yards to a point a quarter of a mile south of their present location which was soon outgrown. John Clough, a cattle dealer, had become interested in the yards by this time, purchasing ground from J. Farley on the present site and putting up pens along the banks of the Platte in 1880. The first incorporation of the stockyards took place in 1881 under the name of Denver Union Stock

Yard Company, by John A. Clough, Jacob Scherrer, F. P. Ernest, J. A. Cooper, J. M. Wilson, William B. Mills and Samuel E. Wetzel. In 1885 the yards were taken over by the Kansas City Stock Yards Company and re-incorporated as the Denver Union Stock Yard Company. Business grew slowly with the transition from trailing to railroad shipment. Changes in ownership and management came with the development of business until the climax was reached in the establishment of branches by Armour and Swift and the subsequent enlargement of locally owned plants, all of which, however, is rather industrial than agricultural. Comparative figures throw the best sidelight on growth of the livestock industry. In 1915, which was, up to that time, the largest business year in the history of the Denver market, total receipts at the Denver yards were 1,605,034 head. In 1925 the receipts totalled 3,455,183 head, an increase of more than 100 per cent in a decade. The 1925 receipts were valued at \$60,000,000. This figure, though inclusive of adjoining states, again illustrates the difference between the spectacular days of the range, when there was much more dust and excitement, and today, when transactions are measured in real dollars instead of romance.

Deflation at the close of the war hit the range industry a body blow. There was a general breakdown of the agricultural industry in the United States, but no branch was hit harder than that which deals with farm animals. It was estimated in 1921 that fifty million dollars had been squeezed out of livestock values in twelve months in Colorado, this including not only range stock, but also the steers and lambs in the feedlots, the beef and dairy animals on farms and the hogs. At the beginning of 1921 the number of range cattle in Colorado was estimated at 1,289,670, while the number a year before was 1,320,000. The number of sheep on the range in 1921 was 1,821,518.

With beef continuing on the luxury list through high retail prices, there came wage reductions and unemployment, withdrawal of credits, shrinkage in the value of collateral, deflation severely criticized by stockmen as untimely and unnecessarily sudden; a combination of circumstances playing havoc with demand and sending the

cattle supply to a stagnant market. For the sheepman the story was little better. He experienced a sharp drop in wool, while the consumer still was taxed exorbitantly for clothing made from shoddy. Lamb feeders had their hope of profits blasted by shipments of frozen mutton from Australia and New Zealand with which the British Government swamped American seaports. No such economic upset had ever come upon the industry and there was no way of quick relief. The whole machinery of production had been centralized and subsidized to war needs at war prices and when peace came in France, the artificial structure crumbled and in its wake went banks, farms and ranches into bankruptcy. The only saving feature was that the land remained, though often in other hands than of those who had farmed it. Upon this asset, which retained its intrinsic worth, a new agriculture has been built up, and along with it the livestock industry has recovered, being in this latter day more and more a part of general farming, for even the mountain ranchman grows hay and feed for the winter and demands of the grass only the seasonal use nature intended it to give.

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CHAPTER XIII

INDUSTRIAL DEVELOPMENT IN COLORADO¹

Frank E. Shepard

EARLY MINING METHODS AND EQUIPMENT—DEVELOPMENT OF SMELTING INDUSTRY—ARGO SMELTER—OMAHA AND GRANT SMELTER—GLOBE SMELTER—CHRONOLOGY OF SMELTERS—CONCENTRATING MILLS AND METALLURGICAL PROCESSES—RECOVERY OF MINERAL VALUES BY FLOTATION—PIONEER MINING MACHINERY MANUFACTURERS—POWER PLANTS—IRON AND STEEL PRODUCTS—COAL MINING—BEET SUGAR FACTORIES—STONE QUARRIES—CEMENT MANUFACTURE—LUMBER AND BUILDING MATERIALS—AUTOMOTIVE PRODUCTS—OIL PRODUCTION—RECENT OIL DISCOVERIES—OIL SHALE.

EARLY MINING METHODS AND EQUIPMENT

Mining was the beginning of Colorado's industrial age. It was the precious metals that lured the pioneer settlers to this region and the efforts of these prospectors to recover gold from the stream beds and the mountains, inaugurated the first industry of the territory.

Simple implements and devices were used at first. Prospecting for gold along the streams flowing from the eastern slope of the Rocky Mountains was conducted by the use of the simple implements and tools of pick, shovel and miner's gold pan, to loosen, excavate and wash the gravels and sands deposited along the water courses. To explore the beds

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below the surface, pits were dug and by means of the hand windlass the gravel and sand were hoisted to the surface to determine the richness of the deposit by washing in the gold pan.

On the discovery of a pay streak, methods of larger capacity were employed in the use of the rocker, long tom and sluice box, into which the gold bearing gravel was shovelled and by means of hand rocking agitation or wash water, the heavier materials bearing the gold were settled to the bottom layers and the lighter sand was washed away, leaving the concentrated values to be cleaned up by means of the gold pan or similar washing methods.

The ever important value of water resulted in the organization of ditch companies for the distribution of water to the various mining operations and the early records display laws and rules governing limitations and rights in the use of water.

The first arrastre to crush quartz in the Gregory diggings on the north fork of Clear Creek, was built in July, 1859. This rude device consisted of heavy stones dragged around on top of a circular pan-shaped pavement on which was placed the quartz to be crushed and then washed by gold pan, or other washing systems of concentration, for the recovery of the gold.

In 1861 various experiments in the treatment of ores were conducted in Gregory and other districts of Gilpin County by means of different types of crushers, systems of treatment by fire, steam and chemicals.

Several properties in Idaho Springs were crushing and concentrating their ores in a twenty stamp mill. On account of the high cost of bringing in metal parts, these early stamp mills were constructed of wood and gave evidence of the ingenuity and skill of these pioneer millwrights.

With all the care possible in the treatment of ores in this period, also with the limited means of recovery in values, the losses of gold were heavy, probably as high as 75 per cent.

A 40-stamp mill and reverberatory furnace was constructed for the treatment of ores in Georgetown in 1864. This appears to be the first commercial fire treatment for the reduction of ores in this district.

DEVELOPMENT OF SMELTING INDUSTRY

The construction of the Hill Smelter, or the Boston and Colorado Smelting Company's experimental plant in Black Hawk, in 1867, was the powerful influence in reviving the mining industry which was waning about this time. The great losses of gold values occurring in connection with the treatment of gravel and ore from mineral deposits required a great change from the crude methods of discovery and so great credit and honor should be given to those whose technical skill and organizing ability developed the smelting industry in Colorado.

Nathaniel Peter Hill, a native of Orange County, New York, graduated from Brown University at Providence, R. I., in 1857 and served that institution as Assistant and Instructor in Metallurgical Chemistry. Boston capitalists engaged his services to investigate the resources of the Gilpin Grant in Colorado and he made several trips to Colorado during 1864 and 1865.

On one of these visits he made a side trip to Gilpin County mines, and observing the wasteful methods of handling and treating the ores, he determined to visit Europe to obtain a more practical knowledge of metallurgy in the smelting plants of Swansea, Wales, Freiberg, Germany and elsewhere. To obtain this information, he secured and shipped ahead to these points, a quantity of the ores for testing purposes. With the more accurate knowledge thus acquired he returned to the United States and was successful in interesting Boston and Providence capital in the organization of The Boston and Colorado Smelting Company.

In 1868 a plant commenced operations for the reduction of the ores of Gilpin County, this installation being at Black Hawk, Colorado. With iron over twenty cents a pound, brick brought from St. Louis, bearing the expense of some six hundred miles haulage by wagon train, and skilled labor from eight to twelve dollars a day, the construction and operation of this plant was very expensive; in addition were the high prices of fuel and other supplies, due to the heavy freight expense and slowness of transportation by wagon trains.

In the experimental stages of the smelting processes, there was also a rather heavy loss of metals, which with a delay of from six months to a year before receiving financial returns on the product, with a fairly liberal overhead charge, necessitated a treatment for ore that seemed somewhat exorbitant to the miner. Notwithstanding the high cost of reduction, the margins for the mine owner, or lessee, were sufficient to make very substantial profits.

The operation of this plant greatly stimulated the mining industry in Colorado and the business grew rapidly. Ores began to come in from other districts and in 1873 a branch was established at Alma, Park County, Colorado, under the business management of Henry R. Wolcott, aided by the metallurgical skill of Professor Herman Beegar.

The Boston and Colorado Smelting Company increased its capitalization and in 1873 erected a smelting plant at Argo, near Denver, under the direction of Dr. Richard Pearce.

Great honor is due Nathaniel P. Hill as a Captain of Industry, whose high scholarly attainments, technical skill and faithful devotion to the smelting industry were applied during a period which greatly stimulated mining operations in the State of Colorado, resulting in the production of great mineral wealth.

ARGO SMELTER

Dr. Richard Pearce, of Cornish descent, was born 1837, in Cornwall, England, and received his engineering training in the Mining School, at Truro, Cornwall, and later in the Royal School of Mines, in London. He was selected by English capitalists in 1871, to erect and manage an experimental plant for treating the ores of Clear Creek County, Colorado, near the present town of Empire. The method of reduction was similar to that in use at the Boston and Colorado Smelter located at Black Hawk, sufficient copper being employed to gather the gold and silver in the form of copper matte.

The Clear Creek ores proved to be deficient in copper and as they carried more or less of lead and zinc, the experimental plant proved unsuccessful. By obtaining copper ore from Gilpin County, the plant operated intermittently



VIEW IN PUEBLO, 1868 (SANTA FE AVENUE)

until 1873, when it was abandoned for lack of suitable fluxing material in the vicinity. The first silver-bearing copper matte had been produced early in November, 1873, and was shipped to Swansea for the separation of the silver.

About this time the Boston and Colorado Smelting Company of Black Hawk, Colorado, which had been shipping matte products to Swansea, engaged the services of Doctor Pearce, who built separating works at Black Hawk in connection with the Boston and Colorado Smelting Company, for the separation of silver in copper matte, hitherto only performed in Europe.

In 1873, he developed at the Black Hawk plant, a process for the separation of gold, which was utilized by the Boston and Colorado Smelting Company until they discontinued business in 1908.

All of the early smelting at the Black Hawk plant was done with wood as fuel and the furnaces were very small affairs, smelting only eight or ten tons per day. Wood was becoming scarce and more expensive as longer hauls into the mountains became necessary to obtain it. The government was threatening suits for the reason that wood choppers may have invaded government land from time to time. The wood was hauled down the mountains by ox teams to the smelter and ore was hauled from the mines by horses and mules. The condition of the roads can be imagined, with two streams of hauling going to and fro during all kinds of weather.

In 1877 the question of fuel became very urgent and seeking for a source of coal suitable for smelting operations, requiring a long flame, the coking coals of Trinidad were selected as a solution. A great deal of this coal was hauled to Black Hawk and tested in the small furnaces with success, after adjusting the grates to the new fuel.

The problem then arose regarding a change in the location of the smelter on account of the almost prohibitive cost of hauling coal from Trinidad to Denver and then to Black Hawk. Denver was finally selected as the logical site for the new smelter and the branch smelter formerly built at Alma and operating from 1873 to 1875, was closed, but the crushing and sampling machinery was left and the place retained as a sampling and ore purchasing agency. Sam-

pling and ore purchasing agencies were also established at Georgetown and Boulder.

The new Boston and Colorado Smelter was built on a tract of land about two miles north of Denver in a new town known as Argo, where building operations were started in 1878. The new smelting furnaces built at Argo were larger than those at Black Hawk and equipped for coal burning, with arrangement for preheating the air before being admitted to the grates. The first smelting operations at the new plant started January 1, 1879.

The old Black Hawk plant was dismantled, except the crushing and sampling machinery which was retained for sampling and ore purchasing agencies.

With the increased size of the smelting furnaces and the mechanical handling of ores, probably the greatest improvement in the new plant at Argo was that of delivering the red hot ore from the roasters to charge hoppers placed over the smelting furnaces, resulting in a great conservation of heat as compared with former methods. The original roasting furnaces were rabbled by hand which involved a very laborious operation.

Doctor Pearce invented and introduced the Pearce Turret Roaster, with upright shaft and mechanically operated, air-cooled rabbles, first applied to a single deck furnace and later arranged for a double-deck furnace. This was probably one of the first mechanically operated roasting furnaces used in America.

Gold and silver were refined at the Argo Smelter and shipped to the Denver mint. The residual product was copper oxide which was shipped to eastern refineries for the production of metallic copper and in later years sold in large quantities to the Standard Oil Company as a deodorizer for oil produced in Ohio and Indiana.

Great honor and credit are due Doctor Pearce and his sons, Harold, Stanley, Richard and Arthur for important improvements in operation and technique of mining and smelting developments in the United States and Mexico.

Important factors in the early development of the smelting industry were such men as Adolph Van Schultz, Albert H. Low and Charles W. Goodale, all being associated with

the Boston and Colorado Smelting Company in its early days.

OMAHA AND GRANT SMELTER

In 1878, James B. Grant was commissioned by his uncle, Judge James Grant, of Davenport, Iowa, to make an investigation of the resources of the Leadville, Colorado, District, for the purpose of installing a smelting plant for the treatment of the ores of that section. James B. Grant had previously been educated at the Iowa Agricultural College, where he devoted two years to study in that institution, after which he studied one year in the Department of Civil Engineering at Cornell University. From there he went to Freiberg, Saxony, Germany, where he took a two years' course in Mining and Metallurgy.

His report on the Leadville District was so favorable that it was submitted to General W. J. Palmer, who had it translated into Dutch with the result that the consent of the Holland stockholders was obtained to extend the Denver and Rio Grande Railroad to Leadville. This report also induced Judge Grant and his nephew, James B. Grant, to erect smelting works at Leadville in California Gulch on a site just below the town.

The initial installation involved a water jacketed smelting furnace of fifteen tons daily capacity, with the necessary equipment of power plant, crushers and sampling machinery, resulting in the starting of operations in 1878. The first month's operations showing a small profit, the capacity of the works was increased by installing more and larger furnaces. Increasing business required a reduction in the cost of delivering coke, which had reached the price of \$60 per ton, delivered, as well as furnishing other supplies for the operation of the smelter; so a freighting outfit was developed comprising 200 mules with the necessary equipment.

In 1880, James Grant sold his one-half interest to Edward Eddy and W. H. James, who were at that time operating sampling works at Leadville under the name of Eddy and James. By 1881, the capacity of the Grant Smelter was over 200 tons per day, but a fire destroyed the entire plant and office, soon after which the business

was consolidated with the Omaha Refinery, resulting in the organization of the Omaha and Grant Smelting Company, including the Omaha Works and the erection of a smelting plant in Denver, in 1882.

To treat the heavy receipts of ores from the entire Rocky Mountain region, also British Columbia and Mexico, a smelting plant at Leadville was leased and the Durango Smelter at Durango was purchased.

The carbonate ores of Leadville decreased with deeper workings and the complexity of ores from other sections necessitated the erection of roasting, desulphurizing and matting furnaces at the Denver plant, as well as the installation of extensive chambers to recover metallic values from the dust and fumes discharged from the roasting, smelting and matte furnaces. To furnish necessary draft for this installation, a brick stack was erected 352 feet, 3 inches in height, which at that time was the highest stack of any industrial works in the United States. This stack is the only equipment remaining of the Omaha and Grant Smelter, which in 1899 reached a capacity of 20,000 tons per month, and in the same year the Company's entire interests were merged into the organization of the American Smelting and Refining Company.

GLOBE SMELTER

The Globe Smelter was built by Messrs. Holden and Chanute, in 1886, and later taken over by Dennis Sheedy and Charles B. Kountze. The financial genius of Mr. Kountze with the remarkable organizing ability of Mr. Sheedy, together with the metallurgical and technical skill of Malvern W. Iles, superintendent of the smelter, brought this organization to a high state of efficiency and successful commercial results.

Under this management were developed important improvements in the construction and operation of silver-lead smelting furnaces, resulting from carefully designed structural parts and the introduction of several labor-saving devices. Mechanically operated roasting furnaces succeeded the older form of hand rabbled furnaces. Movable

matte separators and improvements in the disposal of slag were also introduced.

The Taylor and Brunton system of automatic sampling of ores developed great accuracy in the determination of rare metal values, representing the highest state of the art of sampling at that time.

One of the first installations for the filtration of furnace gases through bags for the recovery of metallic values was installed at the Globe Smelter, all equipment being enclosed in what was known as the Bag House. This equipment no doubt saved hundreds of thousands of dollars in the operation of this plant.

A well designed and equipped refinery was erected for the refining of base bullion into fine silver and gold bars. Notable improvements were made in the design and construction of reverberatory furnaces and mechanical stirring of the molten metal in the desilverizing kettles as well as power presses for the handling of the dross were introduced. In this refinery were installed and operated the first Moebius automatic electrolytic silver cells used in the United States.

The Globe Smelter was the first Western smelting plant to make use of the vertical type of blowing engines for the production of the air blast for smelting furnaces. In 1899 the Globe plant was merged into the organization of the American Smelting and Refining Company, after a very successful commercial and technical career.

CHRONOLOGY OF SMELTERS

While more detailed information has been devoted to the pioneer smelters of Colorado, other important installations were made which contributed to the advancement of the metallurgy of ores. An outline of this smelter development follows:

1872. Mount Lincoln Smelter Works (Dudley Smelter) built. Changed to copper reverberatory in 1873 and operated until 1874. Small blast furnace operated at Montezuma, Summit County. Small matte smelter operated at Whale Mine, near Idaho Springs. Golden City Smelting

Works (Bagley & Sons) operated blast furnace at Golden. Small Mexican smelting furnace operated at Rico.

1872 to 1873. Swansea Lead Smelter (eight tons in twenty-four hours) operating near Empire.

1873. Branch smelter of Boston & Colorado Smelting Works erected at Alma, Park County. Denver Smelter Company lead smelter built at Denver.

1874. Boyd Smelter built at Boulder.

1875. Crooke Smelter built at Lake City, Hinsdale County. Malta Smelter built at Malta, mouth of California Gulch, near Leadville, where predecessor of present Durango Smelter was built. Collom Lead Smelter built at Golden. Golden Smelting Company Smelter altered to copper matting plant.

1876. Colorado Dressing and Smelting Company matting plant began operations at Golden.

1877. Leadville Smelter built at Leadville.

1878. Grant built smelter at Leadville. Small smelter built at Crested Butte. Harrison Reduction Works, of St. Louis, Missouri, built smelter at Leadville. La Plata Smelter built at Leadville.

1879. Eilers & Billings built Arkansas Valley Smelter at Leadville. Little Chief; Ohio & Missouri; Cumming & Finn; Gage, Hagerman & Co.; Raymond, Sherman & McKay; Elgin and Adelaide smelters built at Leadville.

1879 to 1880. Ocean Wave Smelter operated at Lake City.

1880. Grand View Smelter built at Rico.

1881. Smelters erected at Summit County, Kokomo, Robinson, Breckenridge, Lincoln City, Montezuma, Red Cliff.

1882. Present Durango Smelter opened for business. Pueblo plant built by Mather & Geist, at Pueblo. Smelter built at Aspen.

1883. Colorado Smelting Company built Eilers plant at Pueblo.

1886. Globe Smelter built near Denver by Holden & Chanute; later taken over by Dennis Sheedy and Charles B. Kountze; later merged with the American Smelting and Refining Company.

1888. Philadelphia plant built at Pueblo by Holden, general manager for Guggenheim Brothers.

1891. Frank L. Bartlett erected zinc oxide plant at Canon City, called the American Zinc-Lead Company.

1896. Thomas F. Walsh operated pyritic smelter at Ouray.

1897. Small smelter erected at Dunton, Dolores County.

1899. American Smelting and Refining Company organized. This merger included at this time or thereafter all the principal Colorado smelters, namely Omaha and Grant and Globe plants, of Denver; Arkansas Valley, Bimetallic and Union plants, of Leadville; Pueblo, Philadelphia and Eilers plants, of Pueblo; also Durango plant, at Durango.

1900. Rocky Mountain Smelting Company's matting plant built at Florence. Boston Gold-Copper Smelting Company operating semi-pyritic smelter during year. Kendrick-Gelder semi-pyritic smelter built at Silverton.

1901. Semi-pyritic smelter built at Golden. Small smelter built at Rico. Semi-pyritic smelter built at Robinson, Summit County. Salida lead bullion smelter built.

1904. New semi-pyritic plants were erected at Grand Junction and at Pearl.

The foregoing chronology of the development of the smelting industry indicates the important part which smelting has played in creating great industrial centers for the treatment of Colorado ores. Many of these smelting installations were failures but the persistent application of better technical skill and improvements in equipment and methods of operation brought commercial success and high efficiency in the recovery of metal values, the production of which, including gold, silver, copper, lead and zinc in the State of Colorado, from 1859 to 1923, amounted to over \$1,500,000,000.

CONCENTRATING MILLS AND METALLURGICAL PROCESSES

As early as 1859 mechanical devices were employed to increase the capacity, in the treatment of the ores, over the limited amounts possible with the crude tools and laborious methods of the pioneer prospecting days. Early

records indicate that an arrastre was built at the Gregory Diggings in 1859 to crush the quartz from the operations of that district.

Various experiments were made in 1861 in Gilpin County on crushers, chemical and metallurgical methods for the preparation and treatment of ores. In the same year a twenty-stamp mill was operated in the Idaho Springs district. In 1864 a forty-stamp mill was operating in the Georgetown district.

A most interesting fact in the mechanics of mining was the use of the Burleigh drills, introduced in 1868, which were the first steam power drills used in the United States for driving a mine adit.

The use of quicksilver, popularly known to the miners as "quick," for the collection of gold and silver values, soon became the practice in connection with the stamp mills employed for the crushing of the ores. Copper plates were placed below the discharge openings of the stamp mortars, and these plates being coated with quicksilver (mercury), recovered the gold and silver values by the amalgamation of these metals with the quicksilver. This amalgam was scraped off the copper plates and on being heated in a retort, over a furnace fire, the quicksilver was distilled off as a vapor and the gold and silver bullion was poured into a bullion bar.

While this method of amalgamation of the gold and silver recovered in some cases a large proportion of the values, in most cases the loss of gold and silver was high, probably as much as 50 per cent or more.

In order to recover the values which flowed over the copper plates and were not amalgamated, there was invented and developed in Gilpin County a device known as the Gilpin County Bumping Table. This table utilized the action of sharp bumps to agitate the small particles of crushed ore, carried over the table in a flow of water, with the result that the heavier particles of mineral settled into the lower layers, while the lighter particles of quartz, or barren rock, were discharged as waste material.

Amalgamating pans were also used in both gold and silver mills, below the stamps, to grind the ores in the presence of quicksilver, which recovered the gold and silver

values in the form of amalgam, while the quartz or other barren material flowed away from the pans as waste.

These amalgamating devices increased considerably the recovery of the gold and silver values, but there was still too great a loss for commercial success, except in cases where the ore deposits contained high-grade values.

One of the most important improvements for higher recovery of mineral values was the invention and development by A. R. Wilfley of the Wilfley table, a gravity concentrating device first used in the Puzzle Mill, Breckenridge, about 1895. This table became a standard throughout the world and raised the percentage of recovery to a marked degree over former methods.

For such ores as could not be treated commercially by the gravity concentration methods, there were developed the chlorination and cyanide processes which became important in the treatment of the ores from the Cripple Creek district, discovered about 1891.

The first large chlorination mill for the treatment of Cripple Creek ores was built at Colorado City in 1896 and known as the Colorado-Philadelphia Chlorination Mill. About the same time experiments were being made with the cyanide process and great credit is due Philip Argall, mining engineer and metallurgist, who devoted many years to painstaking investigations for the purpose of improving mining and metallurgical methods with particular reference to Cripple Creek ores, resulting in the erection of a cyanide mill for the Metallic Extraction Company, at Florence, Colorado, in 1895, and later he designed a cyanide mill for Stratton's Independence Mine at Victor, in 1909, which operated successfully until 1915, when the property was purchased by the Portland Company.

During this period great interest was expressed as to the question whether chlorination or cyanide would prove more favorable for the treatment of the Cripple Creek ores, which finally resulted in the cyanide process being adopted as the standard treatment, and this practice continues at the present time in the operations of the Golden Cycle Cyanide Mill at Colorado City, and the Portland Mill in Victor, Colorado, in the Cripple Creek district.

The history of the Liberty Bell Gold Mining Company

of Telluride shows the changes and development which took place in the treatment of the ores of that district. In 1898, the ores from this mine were treated in a stamp mill followed by amalgamation on copper plates. Later concentrating tables were added to treat the tailings from the copper plates. In 1900, the cyanide process was installed to retreat the tailings from the concentrating tables and later a canvas table plant was added to treat the slimes. Noteworthy developments at the Liberty Bell Gold Mining Company mill were the installation of the Moore Basket type of filter for the filtering of slime pulps in the cyanide department; also the introduction of the tube mill for the recrushing operations, both of these installations being pioneer installations in the State of Colorado. While this property has discontinued operations, for many years it was one of the most successful mining enterprises and a leader in mining and metallurgical methods.

Large operations were also conducted at the mining properties of the Tomboy Gold Mines Company and The Smuggler-Union Mining Company located in the San Miguel Mining District. Both of these properties are still operating and have for many years maintained successful financial returns from mining and milling operations in locations involving heavy expenses for development and maintenance.

The complex ores of Colorado, involving values in gold, silver, copper, lead, zinc and other metals, presented difficult problems in ore treatment and the different mining districts found it necessary to develop methods especially adapted to the particular requirements of each district. Even in the same district mill systems were varied and changed to meet the changing conditions in ore deposits.

Following the earlier stamp mills and amalgamation systems came the use of jigs for the concentration of the various ores and the separation of the lead from the zinc products. The zinc products were not favorable for treatment in the silver-lead smelters which had been developed throughout the state and penalties were applied in the treatment charges whenever the zinc contents of the ore exceeded a certain percentage.

In many cases of this period zinc became a bugbear

resulting in the discontinuing of the mining of ore bodies containing zinc until favorable conditions developed.

The advent of the concentrating tables of the reciprocating type was an important factor in making separations of the lead and zinc products but the mill systems necessarily became more complicated and required better talent in management and operation.

Continued effort for improvement in the recovery of values from these complex ores brought about also great improvements in the design and construction of ore crushing machinery and auxiliary equipment. The old reliable stamp mill, which had given such good service under the trying conditions of remote mill installations, was succeeded by the Chilian and roller mills and when the practice required finer and finer crushing, the tube and ball mills became the standard.

While these improvements in systems of mill treatment and machinery resulted in higher recoveries of values, the increasing cost of labor, materials and provisions placed additional burdens on metal mining operations until many of the mining districts, once so active and prosperous, declined to the lowest rate of production in years, many operations closing down entirely.

Persistent effort, investigation and research by talent produced from experience in the mining operations of Colorado, then developed the system of ore treatment known as Flotation, which is probably one of the greatest advances made in improved recovery of values from Colorado ores.

RECOVERY OF MINERAL VALUES BY FLOTATION

Pioneer methods in the search for and recovery of mineral values involved the use of the miner's pan which enabled the prospector and miner to separate the valuable mineral particles from the barren rock with which such mineral was associated. The gravel, sand, or crushed ore, with wash water added, was shaken or agitated, with the result that the heavier mineral particles were settled and the lighter particles of barren rock were washed away. Such an operation was known as gravity concentration in which the valuable mineral particles settled to the bottom layers. As a result of many years of investigation and

development of equipment, it was found that crushed ores mixed with water, air and a small percentage of oil would, on being thoroughly agitated, form a froth similar to soap suds and carry the valuable mineral particles to the top of the mass of ore pulp and float the values away from the barren rock. This process of floating the values instead of sinking them was characterized by Walter Renton Ingalls, eminent mining engineer, as "Concentration upside down."

Recent and important developments in this flotation process, known as "Selective Flotation," allows the separation of one mineral from another and so with the complex ores of Colorado, containing values of gold, silver, copper lead and zinc, it becomes possible to remove one mineral, such as zinc, from the others and thus avoid the payment of penalties which existed under former methods of ore treatment.

Colorado contains large deposits of lead and zinc ores and with the price of lead and zinc being about double the price of such metals in 1914, there has resulted in this year of 1926 a marked revival in the mining of these metals which will also increase the production of the associated metals of gold, silver and copper.

Flotation processes have greatly increased the percentages of values recovered, even as high as ninety and ninety-five per cent of the value contained in the ore bodies, and this allows the retreatment of many old ore waste dumps discarded as worthless under former methods of mining and milling. Ores containing values of only a few dollars are now treated with high percentages of recovery as compared with the mining of richer deposits and the greater losses prevailing in former periods.

And so in this State of Colorado, founded on the mining industry, there unfolds a new era in the development of its mineral deposits, creating great opportunities for the production of wealth and a demand for increased activities in agricultural and various industrial operations.

PIONEER MINING MACHINERY MANUFACTURERS

The early hand methods employed in mining operations with primitive tools and equipment limited production in

proportion to the great amount of labor involved and pioneer enterprise soon shipped machinery across the plains under great physical exertion and financial cost. To reduce this great expense in mining operations, companies were organized for the manufacture of mining machinery.

The first manufacturers of mining machinery east of the Rocky Mountains were Hendrie and Bolthoff, established in 1861, who are now one of the leading manufacturing and supply houses in the West. They furnished the greater part of the mining machinery that was used in the early camps of Colorado from drawings obtained from San Francisco and manufactured this machinery in a large shop in Burlington, Iowa. They employed a number of men and operated until twelve o'clock every night, shipping the machinery by team until the railroad was completed to Omaha, when the machinery was hauled by their own teams and those of contractors to Central City, Georgetown and other Colorado mining camps. In 1867 they manufactured and erected a smelter in Montana where Edwin B. Hendrie, now the president of this firm, was in charge of the smelter foundry and machine shop. The smelter treated ore rich in copper, silver and gold and the matte product was shipped to Swansea, Wales, the only point where such smelting operations were conducted at that time. This firm was associated in many important developments of mining, milling and smelting operations and it is such faith, talent and vision that become strong factors in the industrial progress of the Rocky Mountain region.

The discoveries of Gregory in the vicinity of Black Hawk and Central City created a local demand for machinery and in 1869 Peter McFarlane established a foundry and machine shop in Central City which has operated ever since in the manufacture of crushing, hoisting, milling and smelting machinery for the operations of that and other mining sections.

The stamp was soon adopted as the standard crushing equipment by the mine operators following the discoveries of ore deposits in the Black Hawk and Central City mining districts and Peter McFarlane devised and constructed many improvements in stamp mills and auxiliary equipment which increased the efficiency of mechanical opera-

tion and the recovery of mineral values. It was due to his genius that the Gilpin County Bumping Table was developed and introduced following the stamp mill and amalgam plate operations resulting in the saving of additional values which had previously been lost.

In the early operations of the stamp mills it was the custom to break the ore from the mines by hand sledges and hammers; then shovel by hand into the mortars of the stamp mills. The McFarlane shops built the Blake type of ore crushers which were driven by power and thus greatly increased the capacities of the mills.

The first stamp mills were driven by water power, carrying the water from the streams of that section through wooden flumes to overshot water wheels of large diameter which were coupled direct to the cam shafts for the purpose of lifting the stamps to produce a drop of the stamp by gravity. Later steam power was used and the McFarlane shops manufactured steam engines for driving the crushing and auxiliary machinery of the mills; also steam hoists to hoist the ore from the mines.

The McFarlane Shops are still operating and as manufacturers and builders of mills are important factors in the development of that district.

Mr. William P. McFarlane, brother of Peter McFarlane, was associated in establishing and operating the McFarlane Shops for the manufacture of mining and milling machinery and in the late '90s purchased the machine shops of James W. Jackson, formerly located on Fifteenth Street in Denver. William McFarlane for a number of years operated the Fifteenth Street shops for the manufacture of mining, milling and smelting machinery and then erected more modern shops at Thirty-third and Blake streets in Denver. When these shops were built, they represented the latest development in machine shop practice in the various lines of manufacture of mining machinery and indicated the long experience and talent of William McFarlane. This sterling character built sound machinery under high standards of business integrity and was the inspiration for younger manufacturers to carry on for better methods and results. These McFarlane Shops were purchased by William A. Box Iron Works Company and after the installation

of modern machinery and equipment are continuing in the manufacture of sugar machinery, electric hoists, mining, milling and smelting machinery and other specialties.

James W. Jackson was a pioneer in establishing machine shops in Denver and in his shops on Fifteenth Street, in addition to the general manufacture of mining machinery, designed and constructed steam engines of various types to furnish power for mining, milling, smelting and flour mill operations in this section. The continued and successful operation of these steam engines for many years testifies to the genius and talent of this master builder.

His manufacturing business was a financial success and his confidence in the development and progress of Denver resulted in his large investments in Denver real estate and the erection of large buildings in the city. Being an engineer with a keen appreciation of development in mechanical lines, he was one of the pioneers in the operation and use of the automobile and his care and consideration in the operation of his automobile through the streets of Denver would be an example of courtesy and moderation to the automobile etiquette and flaming speeds of today.

J. George Leyner was born in the mining town of Georgetown, Colorado, and as a boy had practical experience in the mining operations of that district. When working as a miner in the Burleigh Tunnel at Silver Plume, his observing and inventive talent led him to study the Burleigh Drill, which was the first steam operated drill, replacing the laborious and slower hand operations used in drilling holes involved in blasting out the ore from the mine veins.

The drilling practice of that period also produced rock dust which was very injurious to the health of the miner, causing inflammation of the respiratory organs and lungs. Steam as a motive power for rock drills was replaced by compressed air but the reciprocating of the long and heavy drill steel required considerable power and the formation of rock dust continued.

Leyner invented a hammer drill operated by compressed air, which actuated a hammer striking the end of the drill steel while the steel was rotated in the hole, thus greatly reducing the required power as well as increasing the work

done. He developed another important improvement in making drill steels with a hole through the axis of the drill steel so that a stream of water could be introduced to the bottom of the hole, thus preventing dust and washing out the rock particles resulting from drilling operations. This was one of the most important inventions for the health, safety and improved efficiency of mining operations. In the '90s he operated a machine shop at Eighteenth and Blake streets, Denver, where he manufactured mining and other machinery equipment.²

He built and organized large shops in Littleton, Colorado, for the manufacture of his Leyner rock drill, drill sharpeners and equipment, and prior to his death, resulting from an automobile accident, these shops were sold to the Ingersoll-Rand Company, who are still manufacturing on a large scale these Leyner inventions, together with other lines of machinery.

Hendey and Meyer, about 1878, organized a machine shop and foundry on a site near the present Union Depot, Denver. In 1885 they erected new shops at Thirtieth and Blake streets, where they manufactured mining machinery, steam boilers, steam engines, mill and smelter machinery. Both of these men were inventors of note, Arthur Hendey having given particular attention to designs of steam engines and devices for improvement in mining, milling and smelting operations.

Meyer invented a valve for steam engines which resulted in considerable economy over former practice. Their designs of crushing and concentrating machinery for the treatment of ores became a standard in that period and machinery of their manufacture gave satisfactory service for many years.

In 1895 the Denver Engineering Works Company acquired the business and plant of Hendey and Meyer, at that time known as the Overland Machinery Company. For

² It may not be known that Shredded Wheat was first produced in Denver and it was Leyner's genius which developed the apparatus used in the first production of Shredded Wheat, the same mechanical principles now being used in the great plants of this country for the manufacture of this product.

twenty-six years the Denver Engineering Works continued manufacturing operations at this site in the lines of mining, milling and smelting machinery and were the first to enter the field in designing and manufacturing electric hoists for metal and coal mining operations.

After the development of the sugar beet industry in Colorado, they constructed the machinery installed in several sugar plants in Colorado as well as in other localities.

One of the machinists, Daniel Waugh, associated with Hendey and Meyer, later invented improvements in the air hammer rock drill which were the basis of the organization of the Denver Rock Drill Manufacturing Company, now operating a large and well equipped plant in Denver for the manufacture of the Waugh drills for distribution to all parts of the mining world. This highly efficient organization has demonstrated the value of commercializing the experience and practice wrought under the pioneer mining days of Colorado.

The increasing demand for improved machinery in the development of mining, ore treatment, smelting, coal mining, sugar beet, oil and other industrial operations and the need to reduce costs of construction; also to develop larger scale production, resulted in the organization of the General Iron Works in 1921, with well designed shops and efficient modern equipment in Englewood, south of Denver.

The Colorado Iron Works Company, The Denver Engineering Works Company, The Queen City Foundry, The Stearns-Roger Manufacturing Company, with shops formerly in Pueblo, and the Vulcan Iron Works merged their manufacturing departments in the new shops at Englewood, while retaining their respective business and sales departments.

The General Iron Works installed the most efficient and modern machinery of the member companies and is now operating successfully with over 800 men employed under the management of The Stearns-Roger Manufacturing Company, which has acquired the machinery lines of The Denver Engineering Works and The Plains Iron Works, successor to the F. M. Davis Iron Works.

This extensive equipment of the General Iron Works, developed from the talent, long experience and traditions

of the member companies, forms the largest manufacturing plant in the Rocky Mountain section and will prove to be an important factor in the development of the great natural resources of the West.

The great development of the Leadville mining district inspired the organization of the Kennedy and Pierce Machinery Company, which was active in equipping the rapidly increasing plants of that district, resulting in the company being taken over by The Mine and Smelter Supply Company in 1897, with headquarters established in Denver. The latter company opened branch houses in El Paso, Texas, and Salt Lake City, Utah, and as manufacturers and jobbers has developed a large business in mining, milling, smelting and general supply lines.

Colorado has long been known as the Mecca for mining machinery and this company has contributed largely to improvements in mining methods and milling operations.

For several years they were sales agents for the extensive machinery line of the F. M. Davis Iron Works and introduced the concentrating table invented by A. R. Wilfley, which table became the standard throughout the world, improving the recovery of mineral values to a very marked degree, over former methods.

Mr. F. E. Marcy, in charge of the Salt Lake branch of this company, invented the Marcy Ball Mill in 1913 and this ore crushing mill was adopted in the large concentrating mills of the West and other mining districts of the world. In 1921 Marcy developed his rod mill, which has added still higher economies to the crushing plants of large operations.

Engineering ability in mining and allied industries owes much to experience gained from the various operations of the Leadville district. Thomas B. Stearns, now president of the General Iron Works, organized the firm of Thomas B. Stearns and Company in Leadville in 1885, and the following year as Stearns, Roger and Company, leased the Excelsior Iron Works in Leadville and in 1890 erected large machine shops at Pueblo, for the manufacture of mining and other lines of machinery. In 1891 this business was incorporated as The Stearns-Roger Manufacturing Company, which has for many years been associated in the

installation of industrial enterprises as engineers, manufacturers and operators.

During the period of the development of the smelting industry in Colorado and the West, much of the great progress in the design and manufacture of smelting furnaces and equipment is due to the genius and talent of James W. Nesmith, who organized the Colorado Iron Works, now one of the member companies of the General Iron Works. Nesmith was one of the master builders of Colorado and the traditions of his life and business integrity made the name of The Colorado Iron Works known throughout the mining world.

Colorado manufacturers participated in the construction of equipment for the United States in the Great War of 1914 to 1918 under an organization known as The General Ordnance Company, composed of member companies: Colorado Iron Works, Denver Engineering Works, Dillon-Box Iron Works, Flint Electric and Manufacturing Company, Plains Iron Works, Queen City Foundry, Shaw Pneumatic Tool Company and The Vulcan Iron Works. This organization manufactured projectile lathes and marine engines for the Emergency Fleet. The distinction of manufacturing marine engines on the banks of Cherry Creek and the Platte River certainly testifies to the versatility of western engineers and workmen.

POWER PLANTS

Previous to 1890 power plants for the operations of mining, smelting, flour mills and other industrial installations were developed involving water wheels, steam boilers and engines adapted to the conditions of the independent plants. About 1890, in Denver, large central power stations were being operated to drive wire cables through underground conduits to haul passenger cars through the streets of Denver.

The Denver City Cable Company installed a very complete power station for those days at Eighteenth and Lawrence streets, to operate the cable lines from Fortieth Street down Larimer Street to West Colfax, thence out to the point where the cement road begins at city limits on its way to

Golden. At this time this Larimer Street cable line was the longest in the United States. Another cable line ran from the Union Station out Seventeenth Street and Seventeenth Avenue to City Park, with cable lines branching from Seventeenth Street to Curtis Street and on Sixteenth Street from Tremont across the Sixteenth Street viaduct, over the railroad tracks and up the hill to North Denver.

W. G. Evans organized the Denver Tramway Company with a central power house at the corner of Colfax Avenue and Broadway, on the present site of the Civic Center. Charles K. Durbin was superintendent of construction and operations of this company through 1898 when the Denver Tramway Company absorbed the Denver City Cable Company and soon after changed from cable power to electrically operated street cars throughout the city.

The Denver Tramway Company formerly operated cable lines from City Park over Colfax Avenue and across the tracks at Fifteenth Street to North Denver; also south on Broadway to Alameda Avenue and served the territory along Eighteenth Street and Nineteenth Street, east of Broadway.

The first electrically operated street railway system in the United States was installed in Richmond, Virginia, in 1887. About 1890-1 electric power was applied for the operation of street railway lines running from York Street, Denver, to Aurora; also another line running from Elitch Garden to Sloan's Lake, where Manhattan Beach was the popular resort of that period.

The Colorado Electric Company was organized February 21, 1881, and was granted the following franchise by the City Council:

"Resolved that permission be granted to any company desiring to supply the city with electric lights, to erect posts, and such other appliances as may be necessary to successfully carry on their business; provided that said companies do not obstruct the public thoroughfares."

In the latter part of 1881, the company began supplying arc lighting service with 2-35 light Brush-Swan machines. W. J. Barker was sent to Denver by the Brush-Swan Company to install and operate these machines, which was the first electrical machinery west of the Missouri River. Mr.



1. VALMONT POWER STATION, PUBLIC SERVICE COMPANY OF COLORADO

2. PLANT OF THE UNITED STATES PORTLAND CEMENT COMPANY AT
CONCRETE, COLORADO

Barker remained with the company through all stages of its development and consolidations, and became vice president-general manager May 11, 1909, which position he held until his death, February 15, 1922, rounding out a service record of forty-one years.

The early street lighting in Denver consisted of eight arc lights on each of eight steel towers located in various parts of the city. In May, 1887, the Colorado Electric Company increased its capital stock to secure funds for additional equipment and in the latter part of the year began furnishing the first incandescent lighting in the state, to the extent of between four and five thousand lights.

Competing companies were organized from time to time, there being five such in the period from 1881 to 1892. In all, the present organization of the Public Service Company includes seventeen or more companies. The first commercial lighting in Colorado was arc lighting in the Daniels and Fisher Store, Denver, in 1881. The load reached about 2,000 KW in 1890, 4,000 KW in 1900, 15,000 KW in 1910, 25,000 KW in 1920 and 45,000 KW in 1925.

Leadville. Leadville was the second town in the state to enjoy electric service. This was started in 1883 in the form of arc lighting. Charles Boettcher was operating an electric lighting plant for local service in Leadville. In 1893 The Citizens Electric Light Company was organized in Leadville, erecting a new plant with improved types of steam boiler equipment and auxiliary machinery, together with the first installation in Colorado of high speed steam engines, direct coupled to direct current electric generators.

This was the first installation of so-called high pressure steam boilers in Colorado, during that period utilizing steam pressures of 125 pounds gauge pressure. The customary steam pressures had previously been 100 pounds gauge pressure.

Such an advance over earlier practice was considered a radical departure, resulting in the state boiler inspector questioning the safety of such practice. With steam boilers commercially operating in this year of 1926 carrying steam pressures of 400, 500 and 600 pounds gauge pressure, and in special cases with steam pressures as high as 1,000 pounds gauge pressure, indicates that the Citizens Electric

Light Company was a leader for better efficiency in power production in Colorado.

In later years the plant of the Citizens Electric Light Company was merged with the Boettcher interests and the Leadville light and power distribution is included in the organization of the Public Service Company of Colorado. When taken over by the Central Colorado Power Company in 1905 the plant capacity was 500 KW. This was increased to 2,000 KW standby plant and tied into the hydro-electric system of the above company, which later became the Colorado Power Company, now a part of the Public Service Company of Colorado.

Aspen. Electric service was started in 1887 with the pioneer hydro-electric plant and the pioneer application of electric power to mine use in the country.

Fort Collins. This plant was started in 1887, with a 450-light Mather and a 1,000-volt, 18-ampere Western Electric service machine. It was operated as an independent plant until 1905, when it became a part of the system of the Northern Colorado Power Company, afterwards the Western Light and Power Company, now a part of the Public Service Company of Colorado system.

Salida. This plant was started in 1887 but with what equipment is unknown. In 1905 two hydro plants of 600 KW each were constructed and connected with the Salida plant, with a 14-mile, 17-KW line. This property was taken over by the Colorado Power Company, now a part of the Public Service Company of Colorado.

Black Hawk—Central City. In 1888 the second alternating current plant in the state was started in Black Hawk, and the pioneer transmission line put in to Central City. This line was three miles long, 1 KW, single phase, used for lighting service only. The capacity was two 250 light machines. In 1902 this plant was tied into the transmission system of Georgetown and Idaho Springs and is now owned by the Gilpin County Light, Heat and Power Company, a wholesale customer of the Public Service Company of Colorado.

Greeley. This plant was started in 1888 by Albert Sechrist, with two 150-light Brush machines. These were changed for two 250-light Thompson-Houston D. C. ma-

chines in 1892 and at about the same time a 35-light Thompson-Houston arc machine was added. Soon after the original plant was started, some attempt at street lighting was made, using thirty-six 16-candle power lamps under tin reflectors on 13-foot wood posts, one being located at alternate street intersections. Alternating current machines were installed in 1898. The Home Gas and Electric Company, a competing company, was started in 1905 and in the same year the original company was taken over by the Northern Colorado Power Company, later the Western Light and Power Company, now a part of the Public Service Company of Colorado. The Home Gas and Electric Company leases the remaining part of the old company's system and is a wholesale customer of the Public Service Company of Colorado.

Georgetown. Electric service was started in 1890 with two 250-light Mather machines. In 1892 alternating current machines were installed and a three-mile, one KW line was run to Silver Plume. In 1900 a water power plant was installed and a five-mile, 11 KW power transmission line was run to Lamertine. In 1902 a transmission line was run to Idaho Springs, Black Hawk and Central City, fifteen miles in all at 11 KW. In 1906 this became the United Hydro-Electric Company and was later taken over by the Colorado Power Company, now a part of the Public Service Company of Colorado.

Idaho Springs. A plant was installed in 1891 and operated until 1902, when service was obtained from Georgetown.

Golden. Electric service was started in the late '80s. In 1906 an 11 KW transmission line was built to Denver, since which time it has been served through the original and present company, The Jefferson County Light and Power Company, as a wholesale customer of the Denver Gas and Electric Light Company, now a part of the Public Service Company of Colorado.

Longmont, Boulder, Colorado Springs, Canon City, Florence, Pueblo and Trinidad. Plants were started in these towns in the period from 1885 to 1895. From 1905 to 1912 Longmont was served by the Western Colorado Power Company. It then became a municipality owned hydro

property. Boulder became a part of the Northern Colorado Power Company in 1905 and is now a part of the Public Service Company of Colorado system. The Colorado Springs plant was supplemented by the installation of the Manitou hydro plant in 1905. Canon City and Pueblo became a part of the Arkansas Valley Railway, Light and Power Company, now the Southern Colorado Power Company, in 1906, at which time transmission lines were constructed between the two cities and into the Cripple Creek mining district. Florence, since 1906, has been, through the Arkansas Valley Electric Company, a wholesale customer of the Southern Colorado Power Company. Trinidad is now a part of the system of the Trinidad Electric Transmission Railway and Gas Company. This company constructed transmission lines to Walsenburg, Aguilar and the Southern Colorado coal fields in 1907, La Veta in 1908 and Raton, New Mexico, in 1914.

Alamosa, Englewood, Littleton and Walsenburg. Alamosa first had electric service in 1902, but to what extent is unknown. This property later became a part of the Colorado Power Company, now part of the Public Service Company of Colorado. Englewood and Littleton first had electric service in 1904 and 1903 respectively. This service was from the Denver Gas and Electric Light Company, now part of the Public Service Company of Colorado. Service as a wholesale customer to the Arapahoe Light and Power Company is still being rendered these cities and environs. Walsenburg is now a part of the system of the Trinidad Electric Transmission Railway and Gas Company system.

Years 1905 to 1913. The greatest electrical development in Colorado occurred during this period—Central Colorado Power Company. Construction of the hydro plant at Shoshone, on the Grand River, was started in 1905. The plant was put in operation in 1909. The Boulder hydro plant was put in operation in August, 1910. Each of these plants has a generating capacity of 14,400 KW. The Boulder plant is the pioneer high head water development of the country, with a head of 1,830 feet. The transmission of 100,000 volts is also the pioneer high tension transmission of the country. The Shoshone-Denver line is 153 miles long and crosses three mountain passes, reaching an

altitude of over 13,300 feet. The system serves the mining section of Central Colorado, the cities and towns in the territory and a large part of the Denver load, it now being a part of the Public Service Company of Colorado.

The Northern Colorado Power Company started operations in 1905, with a 6,000 KW steam plant at Lafayette, using 44 KW transmission to supply the cities, towns, coal mining and rural territory in Northern Colorado. This system is tied in with and is a part of The Public Service Company of Colorado. •

The Trinidad Electric Transmission Railway and Gas Company in 1907 constructed steam stations at Trinidad, Hastings and Walsenburg, connected by 22 KW lines, which serve the cities and coal mines in Southern Colorado, together with the coal mine fields around Raton, New Mexico.

The Arkansas Valley Railway, Light and Power Company, now the Southern Colorado Power Company, enlarged the steam stations at Canon City and Pueblo and acquired a hydro station at Skagway, together with a transmission system to serve the cities and towns in the Arkansas Valley, the Cripple Creek metal mining district and the coal fields in Fremont County.

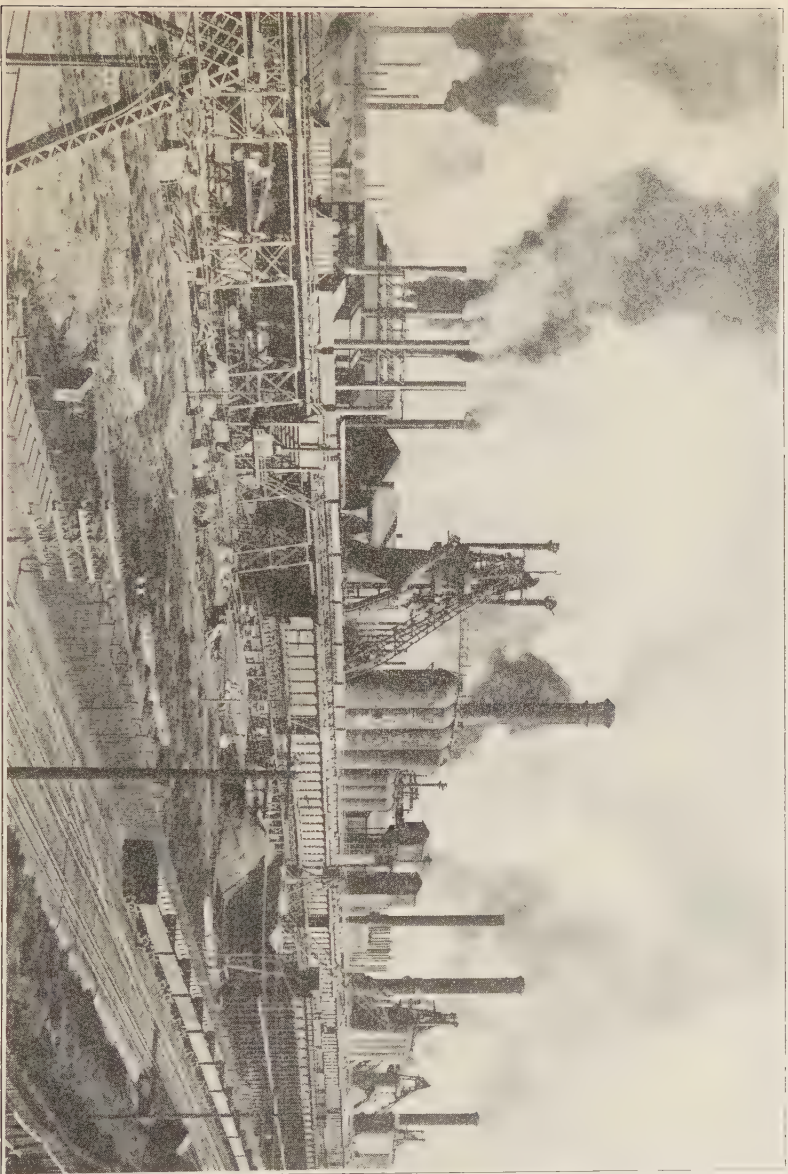
The Summit County Power Company, in 1907, installed a hydro-electric station of 1,200 KW at Dillon, to supply mine power service in Summit County. It is now tied in with the Public Service Company of Colorado, with exchange power agreements. During this period the following cities and towns obtained electric service for the first time either directly from the above systems or as wholesale customers: Aguilar, 1907; Brighton, 1911; Fort Lupton, 1912; Johnstown, 1913; Milliken, 1913; Platteville, 1914; La Veta, 1907; Arvada, 1908; Aurora, 1912; Ault, Eaton and Lucerne, 1911; Loveland, Berthoud and Windsor, 1905; Evans, LaSalle and Kersey, 1913; Lafayette, Louisville, Marshall and Erie, 1907.

Privately owned independent steam plants were installed in Sterling in 1908 (now a separate unit of the system of the Public Service Company of Colorado; Brush, 1909 (now municipally owned); Lamar, 1912 (now municipally owned); Las Animas, 1912; Westcliff, 1915; Estes Park, 1915; Monte Vista, 1911 (now a separate unit of the

system of the Public Service Company of Colorado). Municipally owned plants were installed in Fort Morgan, 1906; Julesburg, 1907; Haxtun, 1913; Holyoke, 1906; Yuma, 1915; Wray, 1913; Burlington, 1907; Holly, 1909; Longmont, 1912 (hydro).

Years 1915 to 1925. Due to the war and unfavorable mining conditions, electrical development was restricted. The outstanding event of the industry in this period was the consolidation of the Denver Gas and Electric Company, Western Light and Power Company and the Colorado Power Company with the Public Service Company of Colorado, September, 1924, and the addition of the Valmont steam station of 25,000 KW capacity. These companies, prior to the consolidation, extended their systems to serve Red Cliff, Minturn, Atwood, Iliff, Merino, Saguache, Center, Del Norte, Antonito and intermediate points. A 44 KW line, 24 miles long, was constructed to the Moffat Tunnel, furnishing the power requirements for construction. Wholesale companies extended their systems to serve Hudson in 1919; Westminster in 1920, Keensburg, 1925; and Pierce, 1919. Independent private plants were installed at Akron in 1919; Roggen, 1918; Ovid, 1921 (system only—power from Julesburg). Municipal plants were installed at Arriba in 1922 (system only—power from Flagler); Fleming, 1921; Otis, 1919; Eckley, 1922; Sedgwick, 1920 (system only—power from Julesburg); Limon, 1917; Flagler, 1919; Seibert, 1921 (system only—power from Flagler); Castle Rock, 1922 (system only—power from Louviers); Fountain, 1919; Cheyenne Wells, 1917; Crook, 1919; Eads, 1920; Granada, 1923 (system only—power from Lamar); Hugo, 1920; Lyons, 1916 (system only—power from Longmont).

In the western part of the state there is electrical history of great interest. Aspen has been briefly mentioned as the location of the pioneer application of electricity to mine power in the country. At Telluride the first high voltage (10,000 volts) power line of the world was installed by L. L. Nunn. In the same section lightning was so severe that no protective apparatus would control it and from investigation and experiments made there the modern protective apparatus was developed. Durango is one of the oldest electric plants in the West. The entire southwestern part



PLANT OF THE COLORADO FUEL AND IRON COMPANY, PUEBLO

of the state is a field of very interesting history of electrical development.

IRON AND STEEL PRODUCTS

The development in metal and coal mining, railroads, machine and metal manufacturing shops, as well as the increasing demand for steel structural shapes in the industrial operations of the Trans-Mississippi territories, led to the organization of the Colorado Fuel and Iron Company with headquarters in Denver, Colorado.

The Colorado Fuel and Iron Company really had its origin in the Central Colorado Improvement Company, founded in January, 1872. This Company developed coal properties in Fremont County, Colorado, and one of the mines opened in 1872, now called the Coal Creek Mine, is still in operation.

In May, 1876, the Southern Colorado Coal and Town Company was formed for the purpose of developing coal lands in Las Animas and Huerfano counties. This Company manufactured coke at El Moro, the first oven turning out its product in 1878.

These two companies were merged into the Colorado Coal and Iron Company in January, 1880, and construction of the present C. F. & I. Minnequa Steel Plant at Pueblo was begun in that year. The first steel was made there in April, 1882, and was used in rolling rails for the Denver and Rio Grande Railway.

In October, 1892, the Colorado Coal and Iron Company was merged with the Colorado Fuel Company and became the Colorado Fuel and Iron Company. Thus this organization goes back in unbroken lineage to 1872—four years before Colorado became a state.

Today the C. F. & I. Company is the largest producer of coal and steel west of the Mississippi. Its products are sold in every state from the river to the coast. It owns and operates thirty coal mines in Colorado, with a daily capacity of 20,000 tons, employing about 5,000 men.

The C. F. & I. Minnequa Steel Plant covers 583 acres, has a yearly capacity of 600,000 tons of steel and employs 7,000 men. In the year ending December 31st, 1925, the

gross receipts from sales were \$34,537,134.76, while the operating expenses were \$29,166,541.76, leaving net earnings from the operations of \$5,370,593.00.

Authorized improvements include a 24-inch merchant mill costing about \$1,500,000, for the rolling of structural shapes and semi-finished steel; large capacity ladles for carrying hot metal from blast furnaces; mechanically fed gas producers for the open hearth furnaces; and enlarged scrap handling facilities for serving open hearth furnaces. The construction program for completion in 1926 calls for expenditures of about \$5,500,000.

The officers of this great industry are: J. F. Welborn, president; Arthur Woods, E. H. Weitzel, S. G. Pierson and A. H. Lichty, vice presidents; E. H. Weitzel, general manager; S. G. Pierson, treasurer; Thomas Aurelius, manager of steel sales; Douglas Millard, manager of fuel sales.

COAL MINING

The coal resources of Colorado are very extensive, including a wide range of grades from lignite, semi-bituminous, semi-anthracite and anthracite deposits.

The completion of the Moffat Tunnel and the organization of transcontinental railroad facilities will make Colorado a very important distributing center for fuel supply throughout the entire Trans-Mississippi territory.

After years of development in the mining of coal in Colorado, such a market being created from requirements of mines, railroads, power plants, smelters, sugar factories and domestic purposes, the coal production for the state of Colorado, for the year 1924, was distributed throughout the various counties as follows:

Boulder County. Operated nineteen mines, and produced 682,000 tons of semi-bituminous coal in 1924. The Rocky Mountain Fuel Company was the largest producer, having produced about 120,000 tons. The largest mine, however, The National Fuel Company's Mine, produced 146,000 tons.

Delta County. Operated about fourteen mines and produced 88,500 tons in 1924. The largest producer was the Juanita Coal and Coke Company, high grade bituminous

coal, 60,000 tons; the balance of the producers only mining semi-bituminous coal.

El Paso County. Operated twelve mines and produced 361,000 tons in 1924. This is all semi-bituminous or known to the trade generally as lignite. The largest producer was the Pikes Peak Fuel Company, located at Colorado Springs, which produced 230,000 tons.

Fremont County. Operated twenty-two mines and produced all told 700,000 tons in 1924, all semi-bituminous coal, of high grade with high heat value; the largest producers, the Colorado Fuel & Iron Company, with five mines, and the Victor-American Fuel Company with two mines, producing 500,000 tons of the above mentioned amount.

Garfield County. Produced 23,000 tons from eight mines, of bituminous coal, mostly all leases.

Gunnison County. Produced 470,000 tons, operating ten mines in 1924. The Calumet Fuel Company, owned by the Utah Fuel Company, and the Rio Grande Railroad, produced 186,000 tons of this amount, being the largest producers—bituminous coal. The Colorado Fuel & Iron Company here operated two mines of semi-anthracite and anthracite coal, producing about 170,000 tons.

Huerfano County. Total number of mines operated—thirty-two in 1924, having a total production of 2,000,000 tons, the largest producer being the Colorado Fuel & Iron Company, with seven mines, and the Calumet Fuel Company with two mines, all producing high grade bituminous coal.

Jackson County. Produced 70,000 tons of sub-bituminous coal in 1924.

Jefferson County. Produced 127,000 tons of sub-bituminous coal, the largest producer being the Leyden Coal Company, with a capacity of 122,000 tons.

La Plata County. Operated fourteen mines and produced 93,000 tons of coal, all bituminous coal, most of it of the coking variety; the principal operators being The Calumet Fuel Company and the American Smelting & Refining Company, who make their own coke for their Durango Smelter.

Las Animas County. Operated forty-four mines and

produced in 1924 3,200,000 tons; eight of these mines being operated by the Colorado Fuel & Iron Company, two by the Victor-American Fuel Company, and one by the American Smelting & Refining Company—the others being small operators. This is all high grade bituminous coal of the coking variety. The Colorado Fuel & Iron Company shipped its slack to the Minnequa Works at Pueblo, where it is washed and made into coke for their steel plant.

Mesa County. Operated sixteen mines, producing 157,000 tons of coal of the semi-bituminous variety. No prominent operators in this field.

Montezuma County. Produced 6,800 tons in five mines, all small.

Montrose County. Five mines produced 2,800 tons.

Pitkin County. Three mines, with the small production of 6,000 tons bituminous coal.

Rio Blanco County. Has eight mines with a production of 5,000 tons a year.

Routt County. Produced 900,000 tons in 1924 from a total of eighteen mines. The prominent producers are The Moffat Coal Company, Victor-American Fuel Company, and the Colorado and Utah Coal Company. The coal produced is a high grade bituminous. Moffat County has immense possibilities for anthracite coal production when the railroad is opened and the demand for anthracite increases.

Weld County. Operated fifteen mines, all sub-bituminous coal, the principal operators being The Rocky Mountain Fuel Company and the National Fuel Company, producing 1,600,000 tons in 1924.

Total production of coal in 1924 was 10,500,000 tons, from 262 mines for the entire state of Colorado.

BEET SUGAR FACTORIES

The "father" of Colorado's Sugar Industry is stated by the Grand Junction *Sentinel* to be Charles E. Mitchell of Grand Junction, who was inspired to investigate the possibilities of sugar beet culture from a trip made by Mrs. Mitchell through the beet sugar factory in Grand Island, Nebraska. In 1893 he visited Lehi, Utah, and associated

with other Grand Junction citizens, brought representatives of the Utah Sugar Company to the western slope of Colorado.

Test plots of sugar beets were grown in 1894 and three carloads of beets were shipped to the Lehi factory, the results from which were very encouraging.

Tariff uncertainties delayed development, but in 1897 James Wilson, Secretary of Agriculture, visited Grand Junction and interest was revived. A mass meeting of citizens from western slope counties in 1898 resulted in Charles Cox, a promoter, aided by Charles E. Mitchell, securing contracts for 3,500 acres of sugar beets and the offering of a bonus by the Mesa County Commissioners induced Mr. Cox to secure sufficient capital to complete a contract with the Dyer Company on February 8, 1899, for the erection of a sugar plant in Grand Junction, in which year the first sugar making campaign was inaugurated.

The Great Western Sugar Company was organized in 1900 by Charles Boettcher and associates who constructed the factory at Loveland. Other companies were organized and factories were built at Longmont, Greeley, Eaton, Windsor and Fort Collins in the years 1902, 1903 and 1904. Chester S. Morey became interested and took a prominent part in the development of the industry.

Eastern capital represented by Henry O. Havemeyer of the American Sugar Refining Company became interested in 1904. Contrary to the idea prevalent that the Havemeyer interests tried to stifle the development is the fact that Mr. Havemeyer and his associates did much to bring the sugar industry of Northern Colorado to its present high state of technical proficiency and financial strength.

In 1905, the Company was incorporated as The Great Western Sugar Company of New Jersey and the organization now includes William L. Petriken, president; W. D. Lippitt, general manager, and the Directorate includes such Colorado men as Charles Boettcher, Claude K. Boettcher, John Morey, R. K. Marsh, Godfrey Schirmer, E. R. Griffin, M. D. Thatcher, Edwin Morrison and Merritt W. Gano.

The Great Western Sugar Company is operating Beet Sugar Plants in the following districts in Colorado: Brighton, Fort Lupton, Eaton, Greeley, Windsor, Fort Collins,

Loveland, Longmont, Johnstown, Sterling, Brush, and Fort Morgan.

The American Beet Sugar Company, in addition to its factories in Nebraska, Iowa, Minnesota and California, is operating two beet sugar factories in Colorado, one at Rocky Ford, erected in 1900, with a capacity of 1800 tons daily, with 392 men employed, and another factory in Las Animas, erected in 1907, with a capacity of 800 tons daily, employing 286 men. The company owns and operates 21,165 acres of land, with canals and sufficient water to irrigate.

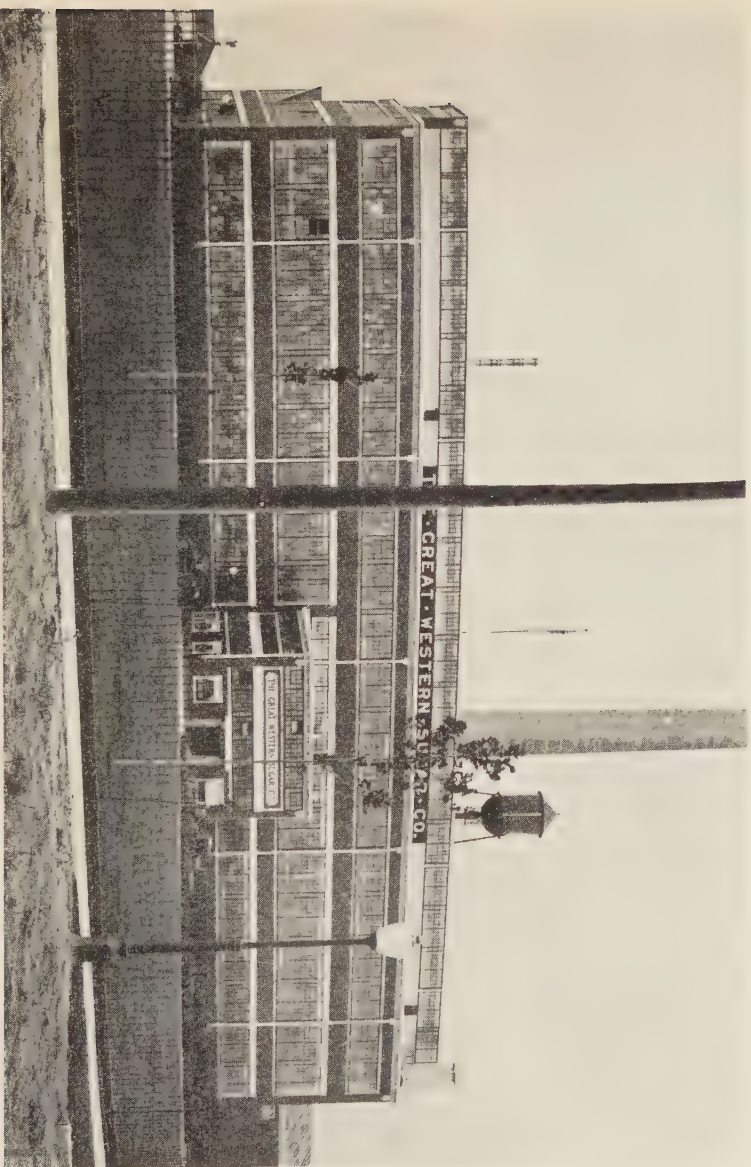
The activities of the company include the manufacture of granulated beet sugar, beet pulp, molasses, and lime for fertilizer. Thousands of cattle and sheep are fed yearly from the by-products of the factories. For the year ending March 31, 1926, the company produced 1,313,219 bags of beet sugar.

The officers of the company are: R. Walter Leigh, president; Franklin Q. Brown and Elisha Gee, vice presidents; Charles C. Duprat, vice president and treasurer; Charles E. Eller, secretary; Thomas H. Devine, general counsel; W. N. Wilds, comptroller.

The Colorado factories of the Holly Sugar Corporation for the production of beet sugar are three in number, one at Grand Junction, erected in 1899, with a capacity of 600 tons daily; one at Swink, erected in 1906, with a daily capacity of 1,200 tons, and one at Delta, erected in 1920, with a capacity of 600 tons daily. The total capacity of all the factories of the corporation, including some outside of Colorado, for the last fiscal year was 1,333,138 bags of sugar.

The officers of the corporation are A. E. Carlton, president; S. W. Sinsheimer, vice president; R. McGinnis, secretary; E. P. Shove, treasurer; with headquarters at Colorado Springs.

The National Sugar Manufacturing Company is, by change of name, the successor of the National Beet Sugar Company, which was organized in 1899 and shortly thereafter constructed a sugar plant of 600 tons rating, at Sugar City, Crowley County. This plant has been in operation ever since.



BETTER SUGAR PLANT AT BRIGHTON

The president of the company is Francis King Carey.

On about three or four per cent of the total cultivated acreage in Colorado, sugar beets produce about 15 or 20 per cent of the total farm value of all crops. The by-products of the factories and the beet fields furnish an important source of low-cost feeds which have played a leading part in the development of Colorado's feedlot livestock industry. This in turn has furnished a better market for alfalfa hay, oats and corn, as well as an improved outlet for producers of the cattle and lambs.

STONE QUARRIES

Included in the varied and vast resources of Colorado, are building stones of excellent quality and of grades suited to wide ranges of construction conditions.

Granites, limestones, marble and sandstones have been used in buildings throughout the state and other localities, and recently travertine of highly artistic quality has been quarried and used in several buildings in Denver.

Gunnison granite was used in the construction of the State Capitol Building. Platte Cañon granite was utilized in the U. S. Mint Building, Denver, and two of the most artistic and substantial buildings in Denver, the Federal Court and Post Office building and the Colorado National Bank made use of Yule marble from quarries located at Marble, Colorado.

The remarkable quality of Colorado-Yule marble and the recently developed quarry of travertine, will ultimately find a wide market throughout the United States although at present handicapped from transportation costs.

Colorado-Yule marble is produced from quarries in Marble, Colorado, a town situated about fifty miles from Glenwood Springs, in the Elk Range of mountains and in the valley of the Crystal River. Its principal industry is the Colorado Consolidated Yule Marble Company, which employs, at capacity, 500 men the year around.

The Colorado-Yule quarries, which are owned by the Consolidated Company, are located three miles from Marble, Colorado, in Gunnison County, and are reached by an electric trolley line on a grade that raises approximately

1,000 feet per mile on a mountain side. The quarries are 10,000 feet above sea level. Within these quarries are 30,000 square feet of operating floor space and the daily productive capacity is from 2,000 to 3,000 cubic feet.

The deposit in present working is 250 feet thick and is exposed for one mile. The deposit is, for practical purposes, inexhaustible. Production of a million feet per year for five hundred years would still leave plenty of marble for later generations.

These facts are demonstrable by actual measurements of the deposit, and before they are discarded as unreasonable it should be remembered that the quarries at Carrara, Italy, which do not cover as great an area and have a similar marble, have been in continuous operation for over 2,000 years and it has been stated that they still produce marble at the rate of very much more than one million cubic feet per annum.

The Consolidated Company properties are fully equipped with electrically operated machinery, the power being generated in the Company's two hydro-electric plants. The mills and finishing shops were complete in every respect until the disastrous fire of April 21, 1925, which destroyed approximately two-thirds of the plant and entailed an actual loss to exceed \$500,000. Operations, however, have been resumed, though in considerably less proportions than heretofore.

Facts and facilities in re Company's holdings are:

500 approximate number of employees.

240 acres white marble.

70 acres mineral land.

250 acres slate.

Investment, approximately \$2,000,000.00.

Colorado-Yule marble is an American product not excelled by Italian or Greek products, and is equally desirable for exterior, interior or monumental purposes, and has been upon the market for many years, and used in many prominent buildings and important memorials in practically all the states in the Union, among which are the following:

Lincoln Memorial, Washington, D. C., costing to exceed \$1,100,000.00 in marble alone.

First National Bank, Lincoln, Nebraska.

Telephone Building, Chicago, Illinois.

Telephone Building, Omaha, Nebraska.

Merritt Building, Los Angeles, California.

Tribune Building, Oakland, California.

Security Trust & Savings Bank, Portland, Oregon.

Courthouse, Youngstown, Ohio.

Municipal Building, New York City.

City Hall, San Francisco, California.

U. S. Post Office, Colorado State Museum, Colorado
National Bank, Daly Insurance Building and the Federal
Reserve Bank, Denver, Colo.

Colorado-Yule marble is installed in over forty public schools in Los Angeles within the last two years, and in several of the country's greatest mausoleums.

Colorado-Yule marble is of fine, even crystallization. It is pure carbonate of lime (99.72%), with neither mineral, nor vegetable, foreign matter to mar its beauty or impair its durability. It takes and retains a very high deep polish and possesses a quality of "life" and translucence which greatly enhances its beauty, and which is not present, in equal degree, in any other American or foreign marble.

The query has been made "Why did the old masters use White Marble in their monumental buildings?" To which an eminent authority replied, "It is the only enduring material to which the classic lines of architecture can be properly executed, giving the lights and shadows fully accentuating the design. Posterity cannot see today's setting sun, nor the architectural lines of the most beautiful buildings, unless the same is preserved in marble that will withstand the ravages of time. Much of the ancient history of the world is preserved to us in marble—the Greek architecture would be lost except for marble."

The material used twenty centuries ago in the highest development of architecture is still the accepted material for the choicest memorial art. White marble temples and monuments fashioned and erected by the ancient Greeks and Romans are still standing in their cities and in perfect state of preservation so far as time is concerned.

Colorado Travertine stone is a comparatively recent discovery, the quarries, located near Salida, having been

developed by John G. Kerr and associates about 1920. It is the only known deposit of true travertine in this country which resembles Roman travertine.

The Colorado travertine has a deep warmth of coloring, is more uniform in texture and not so distinctly stratified as the Roman travertine. The travertine quarried in Colorado has a weight of 135 pounds per cubic foot, a compression strength of 13,000 to 14,000 pounds per square inch; absorbs but a trace of moisture and is composed of about 93.8 per cent calcium carbonate.

The Emperor Augustus selected Roman travertine quarried at Tivoli and the product of the Luna quarries for the numerous buildings and restorations effected under his auspices. Part of the Arch of the Cloaca Maxima and the entire exterior of the Colosseum founded by Vespasian in the middle of the First Century were erected by the former and it was from this building (The Colosseum) that the stones of St. Mark's, Venice, The Cancellaria and the Palazzo Farnese were obtained at a later date. Travertine was used for the exterior walls of nearly all of the churches of Rome, including St. Peter's, the Museum, Church of the Lateran, the Castle of St. Angelo and a portion of the City's walls, which is in use to this day.

Colorado Travertine has been used for both interior and exterior of buildings in Denver, Colorado; Kansas City, Missouri; Omaha, Nebraska; Rawlins, Wyoming; Los Angeles and Long Beach, California, and having the appreciation of architects and builders as a stone possessing superior qualities for construction and decorative purposes, will no doubt become the basis of an important industrial enterprise.

CEMENT MANUFACTURE

The early installations of plants and equipment for mining, smelting, power and other industrial operations made use of stone masonry laid in lime mortar for foundations of buildings and machinery. For large steam engines and heavy machinery it was the custom to finish the top of such masonry foundations with cap stones, finished by hand at considerable expense of labor and time.

About 1890 the practice in the construction of founda-

tions, retaining walls and similar structures changed to a greater use of cement concrete made up of Portland cement, broken rock and sand in proportions adapted to the service. While Portland cement was manufactured in the United States at that time, a large amount of cement imported from Germany was favored for use in making concrete on account of the reliability and uniformity of the German product.

The cement industry in the United States grew rapidly and as the result of research and improvements in technique under the direction of large organizations, the American product became the standard of the world.

The development of reinforced concrete, in which steel is imbedded in the mass of concrete, brought greatly improved conditions in the use of concrete for foundations and structures. One of the first installations in Colorado, involving the use of reinforced concrete, was in some of the structural details of the Equitable Building erected in Denver about 1891.

The industrial development in Colorado created a demand and opportunity for the organization and construction of cement products throughout the Rocky Mountain territory.

The first cement plant in Colorado was erected by Geddes and Seerie in Denver, but was later moved to Portland, Colorado. It was organized in 1899 and was taken over by the Portland Cement Company, which was organized in 1901, the first cement being shipped in 1902. C. Leonardt, now of Los Angeles, is vice president, and M. B. Loy, secretary-treasurer.

This company was organized in 1908 as the Colorado Portland Cement Company, the present company officers are: Charles Boettcher, president; C. K. Boettcher, vice president and treasurer; R. J. Morse, secretary. It operates a plant at Portland, Colorado, where the original plant was built.

In 1906 the United States Portland Cement Company was organized with J. B. Blunt, president; G. D. Cummings, vice president; Lee Champion, treasurer; and W. H. Kelso, secretary. Its plant, located at Concrete, Colorado, began operations in 1908, and in January, 1909, the company

really started on its career, with A. Coors, as president; C. P. Allen, vice president, and J. E. Zahn as secretary-treasurer.

In 1917 this company became a part of the Cement Securities Company group (now the Ideal Cement Company) with plants at Portland and Concrete, Colorado; Devil's Slide, Utah; Trident, Montana; Hanover, Montana; Ada, Oklahoma; and Superior, Nebraska.

The officers of the United States Portland Cement Company at this time are Charles Boettcher, president; R. J. Morse, vice president; and J. E. Zahn, secretary-treasurer.

The various plants have expanded their manufacturing capacities from time to time as the market requirements dictated and at this time the Ideal Cement Company is building a plant near Fort Collins, Colorado, with a capacity of 700,000 barrels a year.

The present capacity of the group is 5,500,000 barrels, of which the two Colorado plants produce 1,750,000 barrels; or, when the new plant begins operations the production of the Colorado plants will be two and one-half million barrels.

LUMBER AND BUILDING MATERIALS

From the crude structure of pioneer days, made of rough logs and fitted into place by hand ax, or adze, to the finished products of the modern lumber mills, is a period which furnishes topics for a most interesting story of an industry which is an important factor in the development and progress of industrial operations in Colorado.

The courage, faith and persistence, under great physical obstacles attending the transportation by wagon, of lumber and building materials from the Missouri River to the early mining settlements, developed great men and master builders and examples of such industry are found in such organizations as the McPhee and McGinnity Company the Newton Lumber Company and the Hallack and Howard Lumber Company.

The foundation of the organization of the McPhee and McGinnity Company was laid in 1869 by C. D. McPhee. The business at this time consisted of a carpenter shop with its small stock of lumber and mouldings and the proprietor

was the entire working staff. In 1872 the business had grown and branched out into a building contracting firm, and a partnership was formed between Mr. McPhee and Mr. Keating. The entire office and lumber yard with a small planing mill for the manufacture of the custom mill-work, not alone for the requirements of this company, but for most of the other builders of this thriving little city, was located at the corner of Eighteenth and Wynkoop streets, not far from where the depot is now located.

Practically all of the rough dimension lumber at this time was produced in a group of small mills south of Denver on the Colorado Springs divide and it was delivered into the city by ox teams. It was no unusual sight to see a load of lumber on the street; the team lying down in the road, while the driver and owner of the load was making the round of the yards and selling to the highest bidder. Clear lumber, sash and doors came from Chicago. No lumber was received from the Pacific Coast.

In 1876 Mr. McPhee purchased the interest of Mr. Keating and conducted the business as "C. D. McPhee." Several yards were doing business at this time. The firm of Lewis and Wheeler was the largest concern of its kind. A smaller yard was run by a Mr. Plato at Twentieth and Larimer streets. Between Eighteenth and Nineteenth on Holliday was the planing mill of George N. Billings. Hallack and Bros. had a small yard at Eighteenth and Holliday. A small sawmill was located near the Platte River about where Colfax now crosses the river.

This firm had several large contracts about this time. The Interocean Hotel, Cheyenne, was built in 1877; a hotel for Lord Dunraven at Estes Park; and the first building for the State University at Boulder, were all under construction by this company. Many of the larger houses, some of which are still standing, were built by Mr. McPhee. They show the quality of workmanship and integrity of purpose which is this present firm's heritage and which it still strives to maintain.

In 1879 Mr. McGinnity was admitted into the firm and shortly the name was changed to McPhee & McGinnity. The growth and expansion of the business necessitated, in 1904, incorporation and the McPhee & McGinnity Com-

pany came into existence. The office and mill were still located on the original site, but the lumber yard had been moved to Twenty-fifth and Blake. The Sayer-Newton Lumber Company was purchased in 1905 and in 1917 was absorbed by the McPhee & McGinnity Company, and the office, mill and warehouse were moved to the present location.

In 1899 the company began the manufacture of paint which would meet the exacting demands of the extreme climatic conditions of this territory. A few years later the growth of this branch of the business necessitated larger quarters and the factory on Blake Street, between Twenty-fourth and Twenty-fifth was constructed. This was the most modern paint factory in the West at that time and was still looked upon as one of the most up-to-date when, in 1920, the business again having outgrown its quarters, the larger factory at the corner of Walnut and Broadway was erected.

It was about 1890 that Mr. E. M. Biggs started a sawmill about half a mile south of Chama, in a beautiful stand of timber which covered that country. From this beginning the business of the Burns-Biggs Lumber Company and the New Mexico Lumber Company was developed. The former company operated at Edith, a small camp located on the border line between Colorado and New Mexico and cut lumber in both states. The adjacent timber was shortly cut out and this camp abandoned and most of its equipment was taken over by the New Mexico Lumber Company.

In 1924 this company began the erection of its modern mill at McPhee, Colorado, a mill which revolutionized the lumber mill business of the state. McPhee is situated about four miles north of Dolores near the Montezuma Forest. It is surrounded by an exceptionally fine stand of timber and forestry officials have asserted that there is available at least 1,000,000,000 feet of merchantable timber on this land. The mill has a capacity of 30,000,000 feet a year which insures a run of several years. All of the timber is Western White Pine which is described as Montezuma (Pondosa) Pine, a name which signifies that it is a Colorado product.

The following table shows the production of lumber (sawed) in Colorado for the past fifty-four years during which records have been kept.

(Figures are from U. S. Agri. Bul. No. 1119 and records in the Denver office of the Forestry Service.)

Quantities are 1000 Feet

1870	-- 13,625	1908	--117,036	1916	----77,580
1880	---- 63,792	1909	----141,710	1917	----71,500
1890	---- 79,906	1910	----121,398	1918	----56,882
1899	--133,746	1911	---- 95,908	1919	----64,847
1904	----141,914	1912	---- 88,451	1920	----67,847
1905	---- 56,753	1913	-- 74,602	1921	----37,300
1906	----110,212	1914	----102,117	1922	----38,853
1907	----134,339	1915	---- 74,500	1923	----38,070
				1924	--- 44,852

The figures for 1925 covering the lumber are not yet prepared. It is interesting to note, however, that in 1925 the New Mexico Lumber Company cut 27,445,360 feet or approximately sixty-one per cent of the cut of the entire state for the year preceding its operation. Nineteen hundred twenty-five was the first year of the enlarged operations of this company.

The Hallack and Howard Lumber Company was formed in 1877, at which time Joseph H. Howard and Charles S. Howard, brothers who had previously been in partnership with The Palmer-Fuller Company of Chicago, came to Denver and formed a partnership with E. F. and Charles Hallack, known as Hallack & Howard.

In 1881, E. F. Hallack retired from the business, disposing of his interests to other parties. In 1888, the name was changed and the company incorporated as The Hallack & Howard Lumber Company, with Charles S. Howard as president and Joseph H. Howard as vice president.

During these years the company had established a number of retail yards in Western Nebraska, Kansas and Eastern Colorado, under the names of Howard Lumber Company and Atlas Lumber Company.

In 1891 Charles S. Howard died and Charles Hallack succeeded him as president. In 1899 Mr. Hallack disposed

of his interest to Joseph H. Howard who then became president and remained actively at the head of his company until his death in 1922. After the death of Mr. Howard, B. Coldren was made president and treasurer, and I. F. Downer, vice president and secretary of the company. Mr. Coldren has been associated with the company continuously since 1888 and Mr. Downer continuously since 1899.

Mrs. Joseph H. Howard, the widow of the former president of the company still retains a large financial interest in the concern.

The company does a large retail business in Denver and a large wholesale business in Colorado, Wyoming, New Mexico, with a capacity of about 15,000,000 feet a year. The Denver plant has a wood working factory in connection and makes a specialty of fine interior finish. Recently the company has enlarged its operations considerably by taking on several specialties, such as steel sash for warehouse and residence construction, etc.

One of the pioneer companies in the production of lumber and the manufacture of wood products was the Newton Lumber Company, organized in 1871, with yards in Colorado Springs and Pueblo. It operated a large lumber camp in Pagosa Springs, Colorado, and was associated in the lumber organization of Hallack, Sayre and Newton, later known as Sayre and Newton.

Newton Lumber Company is now operating with headquarters at Pueblo, and has for many years been identified with extensive building operations throughout the Rocky Mountain territory.

AUTOMOTIVE PRODUCTS

Colorado recognized early the advantages of the automobile in recreation, business and commercial activities and with the development of good roads and the creation of mountain parks, Denver became an important center for the distribution of the various types of automobiles, trucks and accessories.

Great appreciation and honor is due Charles C. Gates for the business ability, confidence and vision devoted to the development of The Gates Rubber Company and the

extensive plant erected in Denver for the manufacture of automobile tires, rubber accessories and leather fan belts. Denver, in Colorado, appealed to him as an economic center of manufacture and distribution for the great Trans-Mississippi territory, possessed a favorable climate and living conditions, would attract an executive, professional and technical personnel of a high degree of talents and with progress and development of industries westward, this enterprise realizes successful results from the economic advantages of the Rocky Mountain territory.

The Ford Motor Company established a branch office and assembling plant in Denver in 1908, originally covering a sales territory including Colorado, New Mexico, Wyoming, Southern Idaho, Utah, El Paso, Texas, parts of the Panhandle of Texas, the western portion of Kansas and Nebraska, as well as the Black Hills of South Dakota. At the present time the sales territory covers Colorado, New Mexico, Wyoming and fourteen counties in Western Nebraska.

The floor space of this enterprise increased from 6,250 square feet in 1908 to 176,250 square feet in 1926. The investment of \$58,000 in 1908 increased to \$1,345,000 in 1926. The number of employees amounted to 460 in 1926, with a monthly payroll of \$65,000 and there were 28,126 cars assembled in 1926. The annual volume of business increased from \$372,000 in 1908 to \$12,000,000 in 1926, with distribution of product through 196 dealers and 511 service dealers in 1926.

In 1926, 25,000 units were sold from Denver requiring 4,917 carloads to handle the freight during the year. Ford cars, trucks, tractors, as well as Lincoln cars are distributed from this Denver plant, with Emory Afton as manager.

In addition to these great enterprises, the automobile sales agencies and supply houses throughout Colorado created a commerce in automotive products of great magnitude, resulting in a powerful impetus to the agricultural, commercial and industrial operations of this section.

OIL PRODUCTION

The first oil field to be developed in Colorado was in Florence, Fremont County, along the valley of the Arkansas

River near the eastern base of the Rocky Mountains. Indications of petroleum were first observed in the course of early explorations by an army officer in the cañon of Oil Creek, about six miles northeast of the present site of Canon City.

In March, 1862, the first active prospecting was begun by Mr. Cassidy, who sank six wells to a depth of from sixty to ninety feet and two to a depth of 400 feet, but found oil only in the strata near the surface. This was pumped, crudely refined and shipped to Denver and other territorial markets, where it sold for \$1.25 to \$2.85 per gallon—the price at one time reaching \$5.00 per gallon. The sales up to 1870 are said to have amounted to 3,000 gallons.

In 1866 and 1873 two other wells were sunk to a depth of 312 feet and 342 feet respectively, without developing any other than the supply already encountered a short distance beneath the surface.

From 1877 to 1885, the Arkansas Valley Land Company, known as the Cassidy Company, The Land Investment and Coal and Iron Company, later becoming the Colorado Oil Company, and the Canon City Oil Company explored the prairie along the Arkansas River below Canon City. These were the first explorations in strata of the Montana group of the Cretaceous which afford the yield of today.

The Arkansas Valley Company was developed from two wells, one located a half mile below Canon City, bored in 1877 and abandoned at a depth of 900 feet without discovering oil; the other near the present town of Coal Creek, sunk in 1880 for water and found oil at a depth of 1,200 feet, but which was abandoned on account of loss of tools and of litigation. This company located about six wells about one and three-fourths miles southeast of Florence, ranging in depth from 1,740 to 3,012 feet, one of which was dry; the others producing from one-half to twenty barrels; one reported 100 barrels per day, some of which are now producing.

The Land Investment and Coal and Iron Company, incorporated in 1882, was taken over by D. G. Peabody and finally became the Colorado Oil Company in 1885-86. The wells of this company numbered about twelve, located near

Florence and ranged in depth to 1,700 feet. There were some good producers although the majority were small in yield. This company and the Arkansas Valley Company were in 1887 absorbed by the United Oil Company.

The Canon City Oil Company was incorporated in 1883. Its only well was located near Oil Creek about six and a half miles northwest of Florence. Oil was encountered at a depth of 300 feet and the well was drilled to a depth of 1,700 feet but salt water caused its abandonment.

In 1892 the companies in the Florence field, in the order of their magnitude, were the United, The Florence, The Rocky Mountain, and The Triumph.

The present organization of the Continental Oil Company, with headquarters in Denver, traces its development back to the early history of the oil business in the Rocky Mountain territory, when Isaac E. Blake, having former oil experience in Titusville, Pa., came to Denver in 1876 as head of the Continental Oil and Transportation Company, and installed a stock of package oil.

E. R. Barton was made manager of the Denver field and in 1877 established agencies in the principal cities of Colorado, Utah and Montana.

The Consolidated Tank Lines Company, under the direction of Mr. Scofield, later president of the Standard Oil Company, entered the Rocky Mountain field in 1880 and was succeeded by the Standard Oil Company in 1882.

The Waters Pierce Oil Company was operating in New Mexico in 1883.

Intense competition existed between these companies operating in the Rocky Mountain territory, finally resulting in the incorporation of the Continental Oil Company in January, 1885, with Isaac E. Blake, president; E. A. Tilford, vice president; and W. M. Patterson, secretary and treasurer, constituting the original board of executive officers, with Messrs. Blake and Patterson in active charge in Denver. Mr. Tilford's headquarters were in San Francisco, where he was also an official of the Standard Oil Company of California.

A great builder in the oil development of the West was U. S. Hollister who came to Denver in 1883 as agent for the Standard Oil Company, succeeding Mr. Morse who had

previously come to the Standard Oil Company from the Consolidated Tank Lines Company.

Mr. Hollister found Denver a city of 25,000 inhabitants, streets unpaved, irrigation water running in the gutters, the telephone a fact but not in general use. Gambling was carried on openly; the Windsor was the finest hotel with the St. Francis a good second, and hotel charges were from \$2.50 to \$4.00 per day. The pioneer spirit of Mr. Hollister, considered such hotel prices too high and he rented a room on West Curtis Street at \$4.00 per month.

The Standard Oil Company plant at the railroad tracks on Eleventh Street consisted of a fairly good warehouse, two small storage tanks and a small office partitioned off from a stable. One night the horses broke down the partitions and on Mr. Hollister's arrival the next morning he found a horse standing in front of his desk, which resulted in approval of expenditures for a new office.

Mr. B. G. Wilson was associated with the Continental Oil Company and previous organizations for many years and had an important part in the organization of various branches of the Company in Colorado, New Mexico, Montana, Utah, and Texas. Many years of his life were devoted to the business of the company in developing facilities for the distribution of oil and other products under most trying conditions.

R. A. Kincaid was chief accountant, bookkeeper, cashier and shipping clerk, an example of one-man business efficiency of pioneer days. Oil deliveries were made by one tank wagon of 400 gallons capacity which was piloted through the muddy streets by one W. M. Potter master teamster and picturesque coöperator in the development of a great enterprise.

Freight rates in tank cars, or packages were 10 cents per gallon from the Missouri River to Denver and 12 cents per gallon from Denver to Leadville and it was estimated that a tank wagon price of 23 cents per gallon nearly covered the cost. A carload of gasoline during this period would have lasted the whole field a year; the only sales being in five and ten gallons cans to druggists. There was so little demand for gasoline in those days that the refiners

had difficulty in disposing of their product, most of the gas distillate being turned into fuel oil or thrown away.

Mr. Hollister piloted the affairs of the oil industry through intense competition and bitter freight rate contests until 1885, when the Continental Oil Company was organized and he was assigned as manager in charge of the lubricating oil business of the South. In 1894 he returned to Denver to assume charge of the rapidly increasing business of the Continental Oil Company and for many years was the inspiration of great business development and improvements in technical operations, retiring after years of hard work, efficient results and service, with the confidence and good will of his associates and the business community.

RECENT OIL DISCOVERIES

Various explorations have been conducted in the State of Colorado since the discovery of oil in the Florence fields, resulting in the finding of favorable indications in Boulder County, the Rangeley field in Rio Blanco County, the Yampa field in Routt County, the DeBeque field in Mesa County and the development of gas wells in Yuma County.

Up to 1920 the Florence field had been producing about ninety-five per cent of the total production in Colorado which in the same year amounted to 110,000 barrels.

About 1923 important discoveries were made in Routt County, in the Craig district; also in the Fort Collins district in Larimer County. The Wellington Well, developed by the Union Oil Company of California, came in as a gasser with the large capacity of 80,000,000 cubic feet of gas during twenty-four hours, and later gave indications of an extensive oil field in the Fort Collins district. Since that time numerous wells have been drilled confirming the presence of important oil resources.

Extensive operations have also been conducted in the Craig field of Moffatt County and the Yampa field of Routt County, by the Texas Company, the Transcontinental Oil Company, the Midwest Refining Company, the Marland Oil Company and other large organizations, resulting in a large commercial production from these fields.

Explorations are now being made in eastern, southern and western districts of the state with the promise of developing oil resources of vast commercial possibilities.

OIL SHALE

With all that has been accomplished in the State of Colorado from the results of mining operations, agricultural development and the sugar beet industry, there looms a new frontier, great in opportunity in the vast oil shale deposits in Western Colorado.

During the past decade government, state and commercial agencies have demonstrated that in a district of about two thousand square miles, known as the DeBeque-Grand Valley district, there exists a potential resource from which oils and other hydrocarbon products may be produced in quantities to create a most important auxiliary supply to the petroleum industry of this country.

Conservative estimates give the amount of oil which may be produced from these shales as being equal to about three times the estimated underground oil pools known throughout the world. To realize such statistics, one has only to survey the various canyons resulting from erosion of the bed of this great inland sea leaving cliffs standing 1,500 to 2,500 feet above the valley floors. The horizontal stratified layers of shale may be traced for miles with sites available for treatment plants and within convenient distance from the Colorado River, which is destined to be the great oil shale center.

The United States Government has recognized the great importance of this resource by creating a naval oil reserve of about 63,000 acres in the vicinity of Parachute Creek and an initial appropriation of \$180,000 is now available and Government representatives are already in the field completing arrangements for the erection of an experimental plant for the development of efficient and practical operations. Large investments have been made by commercial organizations in perfecting titles and conducting investigations to determine the most efficient technique and equipment.

A great amount of research has been conducted by

Government agencies, state bureaus and commercial organizations and a great variety of mechanical equipment constructed, proving that several systems of treatment are available for operations on a commercial scale.

In the development of its mining and metallurgical operations, Colorado has engineering and administrative talent which is competent to meet the problems and practice of this great industry from this resource of the oil shales.

The steadily increasing demand for oils and other hydrocarbon products makes necessary the development of a great auxiliary supply for the petroleum industry, and the source of such supply is found in the vast oil shale deposits of the West. One of the greatest opportunities of the age lies before us in our own State of Colorado and it is time to apply ourselves to the task.

CHAPTER XIV

FORESTRY

By W. J. Morrill

PRESENT FOREST CONDITIONS—EARLY USE AND ABUSE OF FORESTS—EARLY FOREST CONSERVATION AGITATION IN COLORADO—THE NATIONAL FORESTS—TREE PLANTING—FORESTRY EDUCATION.

The forests of Colorado have contributed and still contribute in no small measure to the prosperity of the state. Before railroad transportation brought the communities into close touch with each other and with the products of forests of distant states our own forests provided all of the lumber, fuel, crossties, poles and fencing so necessary in a multitude of developments.

While the present value of the forests in Colorado is chiefly an indirect one and will likely always remain more important as protective covering to our mountains to prevent erosion, and to control the run off of rain water and melting snows, large quantities of timber can wisely be cut annually in perpetuity to furnish local wood-using industries with the raw material for many uses so indispensable to our standards of living. Compared with the forest trees of the eastern states ours do not include many different species and these are chiefly cone bearing, but in quality and yield per acre, the comparison is favorable, though ours are inferior in size, quality and yield to several tree species of the Pacific northwest. The forests of Colorado have occasioned controversies which have made state history which will be outlined in this chapter.

PRESENT FOREST CONDITIONS

But first let us consider the extent and character of these forests, which add so much to the attractiveness and prosperity of Colorado. One-sixth of the state, the

mountainous portion, is still largely forested. Eleven million acres originally were covered with timber suitable for lumber, ties, fuel and posts. This area has not been reduced by more than 1,300,000 acres of cutover, repeatedly burned-over land not restocked with trees, or cleared for agricultural purposes. Very little has been cleared for the latter purpose, since it is characteristic of our forests that they are interspersed with treeless meadows and "parks" more suitable for tilling, and besides, much of the forest areas are at elevations where the growing season is short and the land is steep, rocky and rough.

Aside from the narrow fringe of broadleaf trees (mostly cottonwoods, and willows) which border the stream banks in the plains region, the forest cover of the state falls broadly within two zones: a woodland zone at the lower elevations of light precipitation in the foothills, including piñon pines, red cedars and scrub oaks; and a timber zone, in which the most prominent stands are composed of western yellow pine and Douglas fir, lodgepole pine, Engelmann spruce, in the order in which we ascend in elevation. In addition, there are forest stands and scattered trees of aspen, blue spruce, bristle cone pine, white fir, alpine fir, and limber pine, besides a few others of lesser importance.

The forests of Colorado contain upwards of thirty billion board feet of which the seventeen national forests wholly or partly in the state contain twenty-two and five-tenths billion or seventy-five per cent of the total. In few states, if any, is such a large percentage of the total forested area under forestry management. The state owned timbered lands comprise about 110,000 acres, in scattered tracts, mostly "school sections," found in most of the mountainous region.

The privately owned timbered tracts, generally small in area, are mostly held and managed as portions of stock ranches. The larger cities own an aggregate of about 10,000 acres of forest lands used chiefly for recreation or to preserve the purity of the domestic water supply. The national forests in Colorado comprise 13,249,150 acres, including alienated lands, and, necessarily, considerable "parks," high meadows, barren land and areas above timber line. Of the 10,000,000 acres of timbered land in the state



LEFT- MARKING TIMBER IN WINTER, HOLY CROSS NATIONAL FOREST
 RIGHT UPPER- LOADING OPERATIONS, SAN JUAN NATIONAL FOREST
 RIGHT LOWER- A LOGGING ROAD, COLORADO NATIONAL FOREST

nearly one-half of the area has never been cut into. Considerable of this virgin timber is considered at present inaccessible. While 175 saw mills, largely of the portable type, operate in the state, cutting annually as an average 45,000,000 board feet, the people of the state use annually, it is estimated, 322,000,000 board feet. Consequently we buy from outside the state over six times as much lumber as we cut in the state, and are actually growing at present more wood annually in the state than we are cutting. Few states today are storing up wood faster than they are cutting it. Cutover land generally is reproducing young trees from seed from standing trees, yet we have, as previously mentioned 1,300,000 acres which require artificial restocking with young trees. The United States Forest Service has planted to trees twelve thousand acres, chiefly on the Colorado Springs watershed, and is continuing at the rate of twelve hundred acres annually. Besides, thousands of farmers in the naturally treeless areas of Eastern Colorado are planting annually each a few to several hundred trees for ornamentation of their homes, or for groves and wind-breaks.

Forest fires in an earlier day were common, covering vast areas of fine timber lands, and burning until a rain put an end to the conflagration, little human effort being expended to stop the destruction. But with the organization and manning of the National Forests, twenty-eight years ago, and with the public educated to take care with fire, few disastrous forest fires occur, the acreage burned over annually being usually under 1,800 acres.

EARLY USE AND ABUSE OF FORESTS

The Indians were not destructive of the forests. Of course they never cut the forests, having no use for lumber. Yet they rarely set fires to them except in pique, as when the Utes were driven onto a reservation, when they fired in 1879 large areas of forests at the head of the Alamosa River.

The miners who quickly penetrated all of the mountainous sections of the state soon after the discovery of lode gold in Gregory Gulch in 1859 exploited the forests to provide the logs and lumber for their cabins, fuel and

mining timbers. They were only transients, or believed that they would return to their native states when fortune had been attained. They were not careful to protect the forests. Forest fires were common. Yet we cannot blame the early settlers for the lack of forest protection. Forests were being ruthlessly destroyed at this time in the East and in the Lake States. Man is either dominated by the forest or else he dominates the forest. In the colonial period and for some generations later the forest was a handicap to our ancestors. The forests had to be cleared to give space for food crops, and timber had little marketable value. We were not, and are not now, "timber minded." Not only the miner, but nearly everyone else at this time saw little need for saving forests. The railroads under a very liberal interpretation of the Right-of-Way Act giving the railroads timber for construction purposes, cut great quantities of lumber and crossties. Secretary of the Interior Henry Teller ruled that the phrase "adjacent to the line of the road" in the above act applied to timber growing anywhere within fifty miles of the track and even beyond the terminus of the road. It was not so much the timber cut that depleted the forests as the fires which almost inevitably followed in the slashings resulting from the cutting.

In January, 1880, Dr. E. E. Edwards, then President of the State Agricultural College, poetically described during an address in Monument, Colorado, the forests and the necessity for their protection: "A few years ago, when I first visited the state, their death-fires gleamed like the camp fires of an avenging enemy along the eastern slopes of the snowy range, and every year they are burning. What the fire spares the axe destroys. Whoever makes war upon these forests, makes war upon our civilization, our prosperity, our happiness. They are cutting off our supply of water, drying our fountains, blighting our forests * * * The mountains are our strong and mighty friends. From them proceed all fertility of soil and all healthfulness of climate. Their red granite and gray limestones and sandstones, crumbling, make the soil of the plains. They are a shelter from storms. In their sunset shadows we find rest. They temper the heat of our sum-

mers, moderate the cold of our winters. They are camped along our western horizon like the white tents of an army. Their banner is the cloud. They are the breastworks of our land. They are full of treasure, rich in silver and gold. But there is a treasure as great as these in the snow, folded like a mantle around their shining summits. But for all this all of the land would be as desolate as a field of death. In the snow are the wheat and the corn and the fruit of the vine. It holds the golden harvests that are to wave on the plains below. And the trees are the protectors, the guardian spirits of the snow. Therefore we repeat, protect the trees."

Theft of public domain timber was common. "In their efforts to enforce the laws against timber depredations, government officers were hampered by the fact that registrars and receivers had no power to subpoena witnesses. Citizens did not care to testify, and often hardly dared to, especially in the most notorious cases of fraud, where wealthy individuals or corporations were concerned."¹

While public timber lands were being plundered on a vast scale between 1878 and 1891 the General Land Office officials were unable to receive proper congressional support. Public opinion during this period did not demand timber conservation. Indeed, in some instances forests were deliberately fired to provide dead dry poles, or for the convenience of sheep herders, or even to provide a spectacle. In 1880, however, Secretary of the Interior Carl Schurz mentions that a wholesome sentiment was growing asking for better timber protection. The next year Commissioner McFarland said: "The special agents report that in many localities which have hitherto been hostile to them * * * there at present seems to be a general feeling in favor of the suppression of further depredations."² About this time books and magazine articles on forestry matters began to appear. In 1876 the American Forestry Association was organized in the East, and though not particularly flourishing at first, it is now and has been

¹ John Ise, *United States Forest Policy*, 92.

² *Ibid.*, 93.

during many years, a powerful organization directing public sentiment toward forestry.

EARLY FOREST CONSERVATION AGITATION IN COLORADO

"In Colorado, at first the forest was nothing more than a lucky convenience to supply the meager wants of a few. Lumber as such had not the remotest export value. The forest could not be regarded, or treated, as a natural resource beyond the simple needs of the hour. Forest fires were frequent and destructive, but that was a matter of no concern, for the forest of the Rockies seemed unlimited in extent and inexhaustible for all time."³ But as time went on, as new resources began to develop, as people came to think of permanent homes for themselves and others, they began to realize what the forests meant to a new and growing community, so that twenty-five years after the settling of the state, it came to be seen that something must be done to stop their spoliation and waste, that action must be taken in concert, that they must organize some sort of a permanent association in behalf of forest conservation. Before this time, however, and while Colorado was drafting a constitution for admission into the Union as a state, we learn that Frederick J. Ebert earnestly pleaded for forest conservation.⁴ Mr. Ebert had been trained as a professional forester in a German university. As a member of the constitutional convention, he saw that the committee chosen to present a list of matters for enactment into the organic law had neglected to refer to forest conservation. This was not a surprising omission, considering the times, but to one versed in European forestry affairs this oversight was fraught with dire possibilities. He requested that a standing committee of three on "Forest Culture"

³ W. G. M. Stone, *Forestry Development in Colorado* (Ms. in office of State Forester).

⁴ Mr. Ebert left Germany as an incident of the Revolution of 1848, and became an influential and valuable citizen of Colorado where he engaged in civil engineering and was active in educational affairs, serving as a member of the Denver School Board and as a Regent of the State University. A school in Denver later bore his name.

be appointed to remedy the deficiency. This was done and as chairman of this committee Mr. Ebert later delivered an address to the convention which opened as follows:

"In framing the constitution of a country the greatest attention ought to be directed to the preservation and care of those resources upon which the national welfare of the people depends. This principle finds an especial application with us as far as our forests are concerned. If we do not meet in the constitutions of other states of the Union with provisions in this respect we may consider it an oversight as resulting from the particular condition of those countries at the time of forming their organic acts. But with us the case is different. Our forests require our careful attention, and we ought not to forget to embody in our constitution such principles as will secure to us the full enjoyment of the benefits of our wooded lands."⁵ Mr. Ebert endeavored to put into the organic law provisions for the protection, conservative use and administration of the public forests in Colorado. He proposed the establishment of forest nurseries, modification of the tax laws as relating to forest plantations, and regulation of the timber cut commensurate with the calculated annual growth of timber, all under a State Bureau of Forestry. As forestry principles were not so generally understood fifty years ago, but little of Mr. Ebert's program was adopted; in fact Sections 6 and 7 of Article XVIII were all that were adopted in the constitution. These sections are as follows:

"Sec. 6. *Preservation of Forests*—The general assembly shall enact laws in order to prevent the destruction of, and to keep in good preservation, the forests upon the lands of the state, or upon lands of the public domain, the control of which shall be conferred by congress upon the state.

"Sec. 7. *Land Exempt From Increase Tax*—The general assembly may provide that the increase in the value of private lands caused by the planting of hedges, orchards and forests thereon, shall not, for a limited time to be fixed by law, be taken into account in assessing such lands for taxation."

⁵ Stone manuscript.

These were the first articles ever drafted into a state constitution in the United States recognizing the need for forestry and authorizing the enactment of laws for the preservation of forests.

It is interesting to note that in 1876 the federal government was not believed capable of administering and protecting federal forests in Colorado or elsewhere. It was hoped by many in this state at that time that the federal government would be persuaded to turn over to the state the control of the federal forested lands. A memorial, accordingly, was prepared and sent to our delegate in Congress, the Honorable Thomas M. Patterson, asking for state control of the forests on the Public Domain, but to no avail.

Although the above mentioned forestry provisions in the constitution gave authority, no forestry laws were passed until 1881 when a tax rebate was granted to the effect that lands planted with trees should not be appraised at a higher amount because of these trees during the period of ten years and that a premium of \$2.00 per hundred trees planted should be paid to the owner.

As no provisions or procedure were created for the payment of the premiums, the law was rarely, if ever, employed, although many trees were planted. It was just as well that this omission occurred, since it has been the history in all states that rebates never resulted in much tree planting. Mr. Ebert's views were somewhat too advanced for Colorado of 1876, or for any part of the United States at that time, as forest destruction, by fire and cutting continued apace with little thought by the people as a whole, although a few were aroused to action, notably Colonel Edgar T. Ensign of Colorado Springs. He wrote in 1884 a series of articles entitled "Forestry in Colorado" appearing in the *Colorado Springs Gazette*. These articles inspired support by other newspapers and many citizens, leading to the organization of the Colorado Forestry Association at a convention in the State House in Denver in November of that year. This was the first public organized forestry movement in the state. Again Congress was urged to give to Colorado the control of the public domain forests. If Congress would not do this, Congress

was requested to provide proper protection itself. The Legislature was requested to pass some forestry laws, carefully considered by the Forestry Association, and to create the office of Forest Commissioner, which was done in 1885, by the State Legislature. The law passed was far in advance of nearly every state in the Union.

It created the office of Forest Commissioner and outlined a comprehensive summary of duties in detail. But when finally passed it failed to provide for the Commissioner's salary, for an assistant or for traveling expenses, and the question rose as to how the law could be put into effect. Who could be found for a Commissioner without pay?

"The only logical man for the place was Colonel Ensign. He had led the campaign of education creating forestry sentiment in the public mind. He had spent nine months writing for the press, traveling over the state, organizing forestry clubs, soliciting the aid of the country press, preparing the way for a Forestry Association. So that of all men he was the one best qualified to carry out the provisions of the law, and on the 6th day of April, 1885, he was appointed by Governor Eaton as Forest Commissioner of Colorado for two years. Here was an unusual and vexatious situation. After all the labor of the past nine months must he take the office for two years at his own expense? He had spent not only much time, but many a dollar * * * All that he had hoped for had been achieved except an appropriation to put the law into effect. Could he do it without compensation? A millionaire might, but Colonel Ensign was not a millionaire. * * * At that time the forests were burning at the rate of several thousand square miles annually. It was to do something towards stopping this enormous forest destruction that so much time and energy had been expended to secure the law now waiting to be put into execution. What should the Commissioner do? Must he sacrifice two years additional time out of the best part of his life, or resign, and let the forestry work, so well begun, drop? * * * Colonel Ensign did not hesitate; he accepted the appointment and went to work just as though he were to receive a salary of 'ten thousand a year.' One has only to peruse the reports of these two

years to be convinced of the vast amount of labor performed by one person during this biennial period * * * One is amazed not only at the amount of labor performed, but at its scope and quality.”⁶

Colonel Ensign compiled the state and federal forestry laws, facts as to our forests and an address in a pamphlet entitled “Forestry in Colorado,” sent to all County Commissioners, road overseers and other officials as well as to other prominent citizens. Colonel Ensign’s memory should be perpetuated as the “Father of Forestry in Colorado,” with grateful acknowledgment to the efforts of Frederick J. Ebert already mentioned.

THE NATIONAL FORESTS

In January, 1886, after a little more than one year of existence the Colorado State Forestry Association forwarded to our Colorado delegation in Congress a request for the withdrawal from sale of all timber lands covering the headwaters of the principal streams in the Rocky Mountain region. Such a measure was enacted by Congress five years later.

Colorado endeavored to obtain control of the public timbered lands, in order to protect them, at or before the admission of the state into the Union in 1876. Eight years later the Forestry Association, actuated by the same motives, recommended the same action and two years later, having despaired of state control, asked Congress to take measures to save the federal forests. In no small measure was the State Forestry Association responsible for the Forest Reserve policy which went into effect in 1891. The establishment of National Forests, as they are now designated, was bitterly criticized at first as being un-American, socialistic and certainly revolutionary in our history of the handling of public lands. Many believed that the Government should hold land only as a custodian, ready to turn the land over to citizens when the latter asked for it. The theory had worked well with tillable soil, but not with forests, since forest lands had in every forest region in the United States been exploited as non-renewal resources

⁶ Stone manuscript.



UPPER: McPHEE, COLORADO, MONTEZUMA NATIONAL FOREST. MIDDLE: SAW-MILL, RIO GRANDE NATIONAL FOREST, COLORADO. LOWER: SAW-MILL IN ARAPAHOE NATIONAL FOREST, COLORADO

and not held for repeated crops as demanded by the forestry ideal.

The White River Plateau Reserve of over 1,000,000 acres, in Northwestern Colorado, was the second reserve to be established by the national government, being created one month later than the Yellowstone National Park Reserve adjoining the Yellowstone National Park in Wyoming. Other smaller "reserves" chiefly in best timbered tracts at the lower elevations were set aside until in 1903 they numbered six in Colorado, aggregating only 3,000,000 acres out of more than 13,000,000 acres available. The State Forestry Association led in circulating petitions for the reservation of the whole forested area. The State Legislature, Denver City Council, Denver Chamber of Commerce, Denver Real Estate Exchange, Denver weekly and monthly press, Water Company, Gas Company, twenty-six other leading corporations and business firms of Denver, many of the leading citizens with Gen. Wm. Palmer at their head, long lists from seventeen cities and towns, State Teachers Association, all of the colleges, the State Grange, ten local granges, various chambers of commerce, the state boards of agriculture and horticulture, and other organizations furnished petitions for the extension of the forest reserve policy in Colorado. The policy was not foisted upon the state from the outside. A few years later, however, we shall see an organized effort, temporarily expended, to undo the whole business.

Between 1891, when the first Forest Reserves were established, and 1897, administration of the reserves was not attempted, the fiscal appropriations by Congress not providing for this. When officers were appointed in 1897 and until 1905 the personnel was largely untrained and inexperienced. Many of the superintendents, supervisors and rangers "were appointed through political influence, from walks of life in which they had been indifferently successful. The rangers received \$60 [should be \$50] per month and furnished their own horses. They were uncertain of tenure of office and were rarely promoted. They must fight trespass of all kinds, investigate frauds, report on the location of settlements, enforce the state game laws, scale timber and supervise cutting, and, above all, guard against

fire; able and competent men were needed; and many of the men employed merely brought discredit upon the administration and upon the forest reserve policy.”⁷

There were some notable exceptions to the above general characterization of the personnel. Colonel W. T. S. May in 1898 was superintendent in charge of all Forest Reserves in Colorado and Utah, with headquarters in Denver until 1902, then in DeBeque and then Collbran for a short time, the position being abolished in 1903. Henry Michaelson, born in Denmark, where he received forestry training, was an able administrator of the Pikes Peak, Plum Creek, San Isabel and South Platte Reserves, all, excepting the San Isabel, being later united into the Pike National Forest. The present Forest Supervisor of the Colorado National Forest, William R. Kreutzer, with headquarters in Fort Collins, began his forestry services as a very young man in 1898 in the capacity of ranger under May and Michaelson. Supervisor Kreutzer’s father is said to have practiced forestry on the Keppel and Kreutzer property in Douglas County on Indian Creek from 1881 to 1897.

The Forest Lieu Act, passed by Congress in 1897, provided for the exchange of an unperfected claim on patented land within a Forest Reserve for an equal area on public domain outside of the Reserve. The Government as a rule got the worst of the transaction; it offered the opportunity to settlers to dispose of stripped timber lands and worthless holdings of all descriptions and to receive a “tract of vacant land open to settlement,” or land script for the land thus relinquished, and the script was negotiable.

The better lands of some agricultural value thus incorporated into the Forest Reserves were, a decade later, again opened to homesteading under the Forest Homestead Act of June 5, 1906, and once more alienated.

In 1905 the Forest Lieu Act was repealed after about 3,000,000 acres of land, much of it waste or cutover, had been taken back into the National Forests of the United States and for which an equal area had been selected outside. As the Forest Lieu Act had caused western people to doubt the business acumen of the Government in admin-

⁷ John Ise, *United States Forest Policy*.

istering its holdings, the Forest Service had much opposition to overcome by fair, business dealings. Quoting again from Ise, checked with the recollections of the author of this chapter: "Early in President Roosevelt's administration, Secretary of the Interior Hitchcock gave the forest administration an overhauling, and in December, 1904, Roosevelt signed an order placing the administration under civil service; but the force which was turned over to the Forest Service in 1905, when the reserves were transferred to the Department of Agriculture, was not a very competent body of men. Immediately after the transfer, Pinchot (chief forester in Washington, D. C.) set about to winnow out the incapables, and within two or three years the force was greatly improved; but the West did not immediately forget the previous state of affairs. Furthermore, the efficiency of the new administration was itself a reason for hostility on the part of a certain element in the West. The officials who lost positions, the politicians who lost their influence, the various classes which had profited from the earlier lax administration, felt no great friendship for the new regime. Still other factors contributed to the hostility toward the reserves. The reservation of lands led to a curtailment of land office advertising, and this brought some of the small newspapers into opposition. The reservation policy also interfered with some of the larger business interests, and this affected the larger papers, whose attitude was generally determined by the interests controlling their management. The reservation of lands also cut into the profits of professional land locators—those who made a business of entering lands in the interest of timber companies, cattle companies, and speculators generally."

Much of the opposition to the Forest Reserves was really due to a feeling on the part of users of the resources of these forests that they did not know what oppressive measures might be taken. It was all new and untried. Sheep grazing was prohibited in most forests. Grazing fees were introduced in 1906, not high, to be sure, but establishing a new precedent. The prospectors and miners were charged a moderate amount for timber not growing on their claims. Land laws relative to taking up land and to proving claims were carefully enforced by the forest

officers. Illegal enclosures of land by ranchmen living within the National Forests, as the Forest Reserves were designated after the transfer of administration from the Interior to the Agricultural Department, were noted by the new forest officers and the builders of these fences were made to tear them down, as the laws demanded.

In short a new regime of law and order was administering these millions of acres. It seemed to many that an extraneous government was being imposed upon the West without the consent of the people most affected. Gifford Pinchot, as head of the United States Forest Service, and "Pinchotism," as the application of the forestry rules and regulations was called, received much vituperation. Shortly prior to this, Senator W. B. Heyburn (Idaho) was most active in Congress in his opposition to the Forest Reserves. He had several supporters, even among the Colorado delegation, and several able antagonists in the West as well as East. So far as Colorado is concerned, organized opposition to the Forest Service came to a head in a Public Lands Convention, which held a meeting in Denver in June, 1907. Delegates from most, if not all, of the eleven western states attended, Colorado and Wyoming being more fully represented than the other states. Senator Carter of Montana was chosen temporary chairman succeeded by Doctor Wilson, a large sheep raiser of Wyoming, as permanent chairman. Ex-Senator Teller was a prominent figure on the platform. Senators Shafroth and Clark took part, together with Congressman Mondell of Wyoming and many other western men, great and small, and mostly antagonistic to the policies enforced on the national forests. Secretary of the Interior James Garfield, Gifford Pinchot, chief forester, A. F. Potter, associate forester, and Frederick Newell of the reclamation service were present to defend the administration.

The debates were acrimonious. The credentials of many of the delegates were challenged and the resolutions adopted were therefore largely negated. The convention was said to be "packed" with opponents of the Forest Service. In some way a forest supervisor became a member of the committee which handed tickets to the delegates, and friends of the forest supervisor became delegates. This

he did to confuse and disorganize the convention, and to some extent the trick succeeded.

However, little came from the convention, unless it served as a safety-valve to vent ill will to the national forests and thus relieve the pressure, for shortly the opposition died down.

Prior to 1905 the Forest Reserves had been inadequately managed, in fact unmanned between 1891 and 1897, and from the latter date until 1905 the supervision was not intensive. Then came a period of rapid advancement and aggressiveness which caused consternation in the West. In time the good results became apparent and hostility changed to friendliness. As the years have passed the integrity of the forest officers has been demonstrated, the value of their services appreciated and results of the policies are being favorably known.

At this point, when we have described the intense opposition that developed upon the adoption of an aggressive management of the national forests inaugurated by Gifford Pinchot, it is well to recognize an outstanding Coloradan beloved by thousands, William G. M. Stone, for twelve years prior to his death at Longmont, Colorado, in 1917, at the age of eighty-four, president of the Colorado State Forestry Association, and appointed by Governor Buchtel to the conservation commission which he served throughout its brief existence as chairman. Mr. Stone, born in Wisconsin, entered the ministry after graduating from Oberlin College, serving several years in Boulder and then as pastor of the First Unitarian Church in Denver, resigning in the early '80s to enter the book and stationery business in that city, and later to engage in stock raising and farming at Eaton. Upon retiring from farming due to advancing age he began his activities in forestry propaganda during a critical period. He served for the love of the cause without salary, devoting his whole time in an able and effective manner, contributing many articles to the press, issuing a number of pamphlets and finally leaving a manuscript containing the history of the forestry association he so long and acceptably served as president. This unpublished manuscript has furnished the author of this chapter much material.

Mr. Stone was a man of ability, sterling integrity, untiring energy and magnetic personality, inspiring a loyal following whose efforts did much to uphold the forestry and conservation policies during a period of determined attack.

As a result of the conference of governors of the various states held at the White House, May 13 to 15, 1908, called by President Roosevelt to consider the subject of conservation of the natural resources of the United States, Henry A. Buchtel, then governor of Colorado, by request of the President of the United States and chairman of the National Conservation Association, on the 28th of November, 1908, appointed a commission on the conservation of the natural resources of Colorado, consisting of twenty-one members. The commission as chosen by Governor Buchtel never met for organization, as it was nearing the end of the governor's term of office, but Gov. John F. Shafroth, who succeeded Governor Buchtel, reappointed on the 17th day of February, 1909, the twenty-one previously chosen and in addition fifteen others. He designated Frank C. Goudy as chairman, who, upon delivering an able address supporting the principles of conservation at the first meeting, March 4, 1909, was elected president and W. G. M. Stone was made secretary, and committees were chosen on resolutions, legislation, waters, forestry, coöperation, lands, minerals and natural history.

During 1909 and 1910 the commission met at frequent intervals. The *Official Proceedings of the Colorado Conservation Commission* from March, 1909, to April, 1910, published in the latter year, contains a number of splendid addresses pro and con on the matter of conservation which engrossed the attention of the public throughout the whole country at that time. J. Arthur Eddy eloquently pleaded for a continuation of the development of the state without the restrictions imposed by conservationists; to quote from an address: "The doctrine of free soil, applicable to all the natural resources of the public domain, must remain co-existent with our government until every foot of the public land has passed equitably to its rightful owner, viz., the individual. Nor must it be allowed in the slightest degree to rob Americanism of its distinguishing quality, viz., individualism. The incentive of property interest, coupled with

education and moral suasion, should meet all demands of conservation."

Dean William C. Sturgis of Colorado College, following Mr. Eddy, stated the opposite view as held by conservationists: "While, therefore, everything should be done under existing circumstances to encourage the planting of forest trees by individuals so that every farmer should have his own woodlot as a source of lumber and income, it is difficult to imagine how, even in an ideal community, the individual ownership of forest lands could subserve the best interests of either the forest or the community.

* * * * To turn over vast areas of the public forested domain to individuals whose eyes are fixed only on immediate profits of the largest possible dimensions, or even to permit the private ownership and unregulated control of the country's most valuable assets, seems to me to say the least an injudicious and a destructive policy. There are times and circumstances when the rights of private ownership must give way to the welfare of the community."

Hon. Earl M. Cranston urged an inventory of the state's natural resources and the establishment of a state commission clothed with authority and furnished with ample means to prevent wasteful use of water, timber and coal. How to save wild game of Colorado from destruction was discussed. The misuse and waste of forage with remedies had a hearing.

Hon. James R. Garfield, ex-secretary of the interior, addressed a meeting of the commission, outlining the government's policies relative to control of water power development within the national forests to insure actual construction work within a reasonable time after obtaining the permission to proceed, to fully and not partially develop the opportunity, and to retain certain powers by the government in order that unlawful combinations in restraint of trade might not be effected. Attorney Gen. John T. Barnett and Gen. Irving Hale, manager of the General Electric Company, offered and defended objections to certain portions of the government's policies relative to water power.

Altogether the commission served a distinguished and

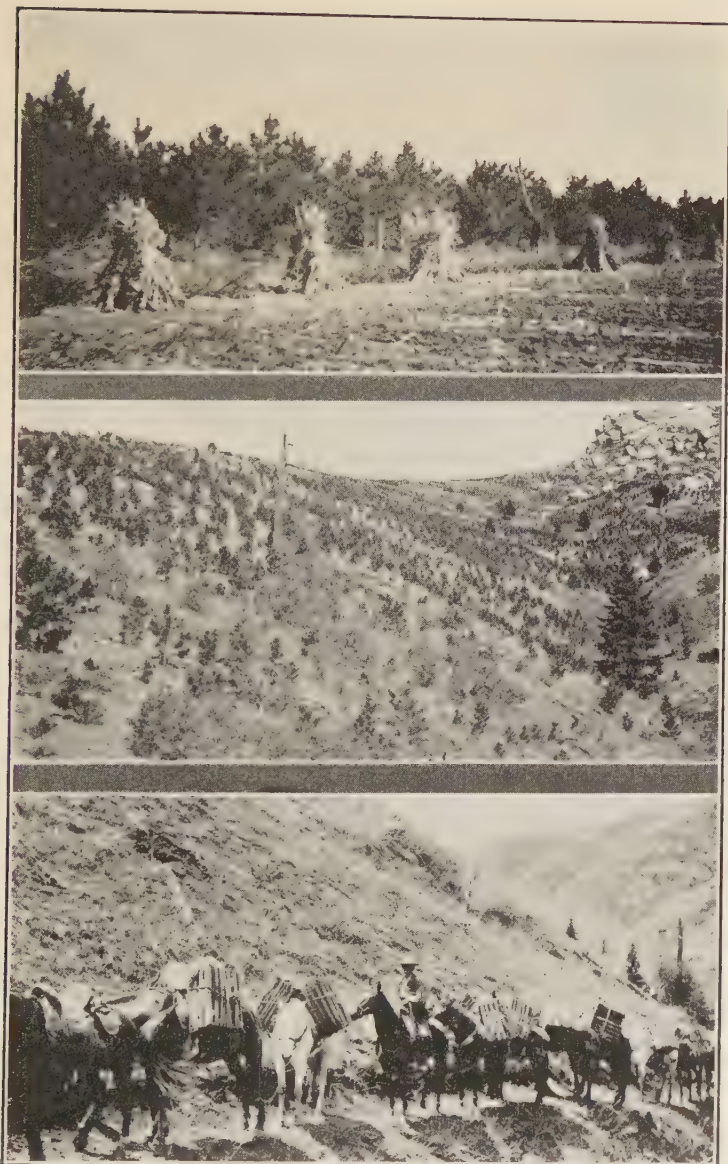
useful purpose in clarifying the problems of conservation which agitated the Colorado public of fifteen years ago.

An incident of the attack on the United States Forest Service in 1907 was the testing of the authority of the Government in prosecuting owners of livestock in trespass upon the national forests. The forest regulations forbid grazing without a permit upon the national forests. Fred Light, a stockman on the Western Slope, backed by the Colorado Stock Growers Association in a "friendly" suit with the Government, attempted to prove that the rules and regulations of the United States Forest Service, as promulgated by the secretary of agriculture, did not have the force of law. His stock was purposely permitted to cross the unfenced boundary of a national forest on which he had secured no permit and had paid no grazing fees. Colorado also has a "fence law" which requires an area to be fenced with a legal fence before damages can be claimed for trespass of livestock. The Government contended that Congress had delegated to the secretary the matter of making rules and regulations which had the force of laws and that "any violations of the provisions of this act (June 4, 1897) or such rules and regulations shall be punished as is provided for in the act of June 4, 1888, etc." Furthermore the Government contended that the Colorado fence law did not apply to federal lands. In all of these contentions the Government won in the Federal District Court, and the case was not appealed to the U. S. Supreme Court. This strengthened the hands of the administration of the national forests and contributed to the acceptance of the federal forestry policies.

TREE PLANTING

Forest tree planting for ornamentation around the home, for groves and windbreaks was successfully practiced on the irrigated farms from the beginning of the development of such farms; cottonwood, willow and silver maple being the chief species used.

Forest tree planting in the great plains region out of the irrigated sections began with the settlement of the non-



Upper: Western Yellow Pine, planted on non-irrigated land in Washington County. Trees 17 years old. Middle: Re-forestation, Pike National Forest. Lower: Pack outfit loaded with 20,000 Douglas fir transplants en route to planting area, Gunnison National Forest

irrigated lands for crop production, which became important only less than a score of years ago. Many failed because of planting species not adapted to the severe conditions occasioned by scanty rainfall, strong winds and the periods of mild weather in the winter which stimulates a brief growth activity only to be succeeded by killing cold. In 1909 the Colorado Agricultural Experiment Station, coöperating with the United States Forest Service, planted upon the substation farm at Akron, Colorado, nine species of broadleaf trees and in 1911 seven species of conifers in a shelterbelt extending around the north and east sides of the 160 acre tract which was granted to the Agricultural College by the government for this special purpose as well as for dryland experimental farming. Since 1911 the State Forester has used this experimental tract for the study of the behavior of these species in that region typical of Eastern Colorado, and other species have been introduced in later years.

In order to encourage the planting of suitable hardy species the State Forester since 1917 has distributed at cost forest tree seedlings in quantities up to 100,000 a year to farmers in all parts of Eastern Colorado. It is believed from inquiries conducted that 59 per cent of the seedlings of all species survive for at least three years on the non-irrigated lands and seventy-two per cent on the irrigated lands.

It may be said that any farm in Colorado capable of supporting a family by tillage of the soil can have shade trees by planting the hardy species and giving the requisite care at and after planting. Tree production on the great plains is not advocated as a profitable crop *per se*, but the presence of trees relieves the monotonous levelness of the landscape, provides grateful shade and wind protection, embellishes the home, and leads to contentment of the residents and stability in tenure.

FORESTRY EDUCATION

Colorado College in Colorado Springs established the Colorado School of Forestry as a department in 1905, fitting young men with a thorough technical training in the fund-

amentals of forestry. The school owns 6,200 acres of western yellow pine forests in the Rocky Mountains twenty-seven miles northwest of Colorado Springs. Half of the forestry teaching is done in this forest.

Colorado Agricultural College in Fort Collins offered its first four year course in professional forestry in 1909. In 1915 the course was enlarged and improved. At the close of the war a large number of ex-soldiers under the Veterans' Bureau enrolled in both a special two year Forest Rangers' course and the regular four year forestry course leading to a degree, and during the past several years have filled many openings in the Forest Service in Colorado and neighboring states. Special opportunities are given for grazing management instruction. The college owns 1,600 acres of lodgepole pine and Engelmann spruce forest with a lodge for summer instruction fifty miles west of Fort Collins.

The Conservation Commission recommended that the Legislature make provisions for the employment of a State Forester. This was done in 1911, Professor B. O. Longyear of the Colorado Agricultural College being the appointee by the State Board of Agriculture. On account of poor health Professor Longyear was succeeded by Professor W. J. Morrill in 1915 who still holds the office. The duties of the office as prescribed by law are "to direct the management of State Forest Reserves, if any; to collect and publish all data relative to the forests and other timber growing in the State; to coöperate, so far as is practical with the Department of Forestry of the United States Government; to promulgate and publish rules for the prevention of Forest fires; to study the best conditions for preserving and growing of trees and forests." He "shall coöperate with the State Board of Land Commissioners in the matter of granting of permits for cutting timber upon state lands, giving them data concerning the proper timber to be cut and the proper method of cutting and removing the timber" and in general to act as a consulting forester for the state, assisting in fire protection, giving forestry advice to individuals, associations, towns and cities and to act as professor of forestry at the State Agricultural College. A forester, Chester A. Lee, was employed by the Ex-

tension Service of the Agricultural College beginning in 1925, as a field man to stimulate tree planting and the better management of forests on the mountain ranches. His business is to teach forestry to the people of the state, especially to the farmers.

American Forest Week is observed generally in the state by the schools, civic clubs, women's clubs and by notice by the press. Arbor Day, the third Friday in April, set apart by an act of the legislature in 1908, has been a school holiday during which tree planting or other appropriate exercises and observances are held.

Colorado is peopled with lovers of the out-of-doors, her wonderful mountains and beautiful forests. Her people are determined to perpetuate unsullied and undepleted these resources as a legacy to the future generations. Much has been accomplished to this end and much still remains to be achieved. The foregoing chapter is a record of the past few generations in relation to the preservation of her forests which mean so much to the welfare and happiness of the state. It seems fitting to close by quoting from Theodore Roosevelt who fought valiantly and successfully for the western forests: "A people without children would face a hopeless future; a country without trees is almost as helpless; forests which are so used that they cannot renew themselves will soon vanish, and with them all their benefits. When you help preserve our forests or plant new ones, you are acting the part of good citizens."

CHAPTER XV

TRANSPORTATION

By Arthur Ridgway

INTRODUCTION—PACK ANIMALS—WHEELED VEHICLES—FIRST ROUTES—PIKE'S PEAK RUSH—FIRST TRANSPORTATION COMPANY—OVERLAND STAGE LINES—EARLY TOLL ROADS—OVERLAND TRAFFIC — TRANSCONTINENTAL RAILROAD SURVEYS—GUNNISON SURVEY—PACIFIC RAILROAD—BERTHOUD PASS SURVEY—KANSAS PACIFIC SURVEYS—FIRST COLORADO RAILROAD—DENVER AND RIO GRANDE—ROYAL GORGE WAR—EXTENSIVE CONSTRUCTION—EARLY RAILROADS—DENVER SOUTH PARK AND PACIFIC—OVERLAND MOUNTAIN TRANSPORTATION — COLORADO MIDLAND — PLAINS RAILROADS—MOUNTAIN RAILROADS—CHECK IN RAILROAD CONSTRUCTION—RAILROADS RESUME GROWTH—THE MOFFAT ROAD—UNCOMMON TRANSPORTATION—THE INTERURBANS—THE AUTOMOBILE—PEAK IN RAILROAD MILEAGE—THE MOFFAT TUNNEL—COMMERCE OF COLORADO—BIBLIOGRAPHY.

INTRODUCTION

To record the progress and development of transportation in Colorado is to tell the story of almost every form of communication the world has ever known. Here, as perhaps never elsewhere, have all save one of the various forms prevailed in their natural order in the brief space of 100 years, and here, as nowhere else in the Nation, have natural influences been the dominating factor in the field of transportation.

It is often a question whether the onward march of civilization leads or follows transportation progress. Whatever doubt there may here have been as to the general premise, certain it is that progress in the earlier forms of travel, communication, and carriage of goods was coordinate with if not actually subordinate to the settlement of the country. Those general laws, both natural and arti-

ficial, which govern prevalent modes of transportation among men have here exerted the most pronounced effect in the conquest of the West.

With the vast area of the mountain country completely isolated in a veil of formidable mystery, pierced only here and there by some intrepid explorer or adventurer whose reports were entirely inadequate to convey any idea of its geography, small wonder is it that the need of transportation was so long delayed as to create a clamor in no uncertain terms when it later became a reality. Here today an Indian village of hundreds who by the dawn of tomorrow had completely vanished with all their property, leaving behind only scant signs of their ever having existed; there ahead the trackless expanse of the great treeless plains, the very broadness of which like an unchartered sea overawed all but the most daring; still farther westward that dark and mysterious mountain region reputed to be impenetrable; and wherewithal no navigable streams—these were the salient geographical conditions which rendered absurd any conception of local transportation needs.

Unless the geography of a country discloses non-itinerant inhabitants who have a desire for intercommunication, actual or prospective communities that create or consume physical property, dormant or developed natural resources, sufficient fertility of the soil to produce with the application of toil food for man and beast, or climatic conditions conducive to the sustenance of vegetable and animal life, no mode of transportation of however crude and primitive a character it may be can even be established, much less prevail. Colorado with its rugged and snow capped mountains and its comparatively level plains was in the beginning of this sort.

Though geography may be favorable in any or all of these features, another distinctively controlling factor is to be found in topography or the local configuration of the earth's surface. More often does this govern the particular mode of transportation prevalent than in retarding or developing transportation in its broader sense. Perhaps no area of like extent on the globe so markedly as Colorado typifies topographical influence on systems of transportation. Notwithstanding most of the large rivers in Western

United States have their sources in Colorado, there is not a single navigable stream within its borders, and hence water-borne traffic of any kind is lacking.

East of the 105th meridian the topography is such that routes of travel and traffic can be and were in the early days established in almost any direction following only the axiom that a straight line is the shortest distance between two points. On the other hand, that portion of the state westward from the 105th meridian, even to the western confines of the commonwealth, presents an entirely different aspect. Here is found probably the most rugged and surface broken area of equal magnitude on the continent. Throughout its entire course of 526 miles between the forty-first and thirty-seventh parallels of latitude, the northerly and southerly boundaries of the state respectively, there is but one place, Muddy Creek Pass, where the continental divide is less than 10,000 feet in elevation above sea level. The rocky faces of the mountains often present impassable barriers even to pedestrian travel, and precipitous slopes render direct routes utterly impossible. Therefore physical communication of any sort, either through this area or between localities within its borders, must be accomplished via circuitous routes. The only available avenues are the watercourses which, owing to the nature of the geological disturbance peculiar to the region, constitute sinuous defiles, with few and irregularly spaced natural doorways opening out into the parks and mesas between the peaks and ranges. Thus it occurs that railways, highways, byways, and even trails follow routes of undulatory profile and tortuous alignment.¹ It is quite probable that with renewed

¹ SOME STRIKING COMPARISONS:

From	To	Air Line Distance Miles	Shortest Railroad	Difference Miles
			Distance Miles	
Denver -----	Leadville -----	75	151	76
Denver -----	Wolcott -----	90	319	229
Pleasanton -----	Villa Grove -----	12	50	38
Westcliffe -----	Crestone -----	16	115	99
Leadville -----	Aspen -----	30	131	101
Aspen -----	Crested Butte -----	24	288	264

activity in some of the mining districts of the mountains pack trains will still be a common form of transportation and freighting by wagons an imperative necessity, while in a country of less severe topography trails would be transformed into roads and roads into railways.

Prior to the coming of the white man the Indians roaming the plains east of the mountains did undoubtedly use their ponies for carrying loads, but such use was confined very largely to riding and to bringing in the products of the hunt. These aborigines were not packers, however, and it was only contemporaneously with the early explorations and subsequent advent of white settlers that the practical science of packing became prevalent.

PACK ANIMALS

The common mode of transportation of the plains Indians consisted of a sort of crude litter formed by lashing the ends of the sapling poles of the tepee to the sides of a pony, allowing the opposite ends to drag on the ground. On these poles which sloped rearward from the pony to the ground a mat formed of the tepee and hides was fastened far enough behind the animal to avoid interference in travel. Tent poles were scarce, and therefore since they must needs be moved from one camp to another, their itinerant owners pressed them into this service as a sort of carriage for the feeble or disabled adult members of the tribe or small children or for personal effects that had to be taken along on the journey.

However satisfactorily this mode might serve the nomads of the plains, it was utterly impracticable in the mountains, and the common use of pack animals may be said to date from the excursions of the Spaniards north-

Florence	Somerset	20	133	113
Lake City	Ouray	21	110	89
Lake City	Creede	24	269	245
Lake City	Silverton	26	305	279
Ouray	Silverton	16	218	202
Ouray	Telluride	10	55	45
Creede	Silverton	34	314	280
Silverton	Telluride	13	177	164
Silverton	Rico	23	142	119

ward from Santa Fé or even from the quest of Coronado in 1540. While pack animals served as the only commercial means of transporting goods from place to place until the coming West of wheeled vehicles in the early part of the nineteenth century, yet it was not until many years later that their importance as carriers of mountain commerce was recognized. The stubborn resistance to displacement by other forms of transportation in Colorado was simply a repetition of the history of the Nation. An illustrative instance can be found in the fact that as late as 1783 pack animals were the only means of commerce between Philadelphia and Pittsburgh. Even today a burro, pack-mule or pack-horse constitutes our only means for the carriage of goods to otherwise inaccessible points in the mountains.

Quite naturally the art of packing was developed from crude beginnings, and probably reached its highest degree of perfection in our own mountains. At first there were no manufactured materials available for pads, blankets, saddles, girths, cruppers, or breechings, and all of these had to be improvised on the instant. This resulted in different kinds of equipment, depending on the resources at the command of the packer. Again, the kind of an animal, horse, mule or burro, had a very decided influence on the character of equipment necessary. Although the Spaniards were responsible for the appearance in the West of the burro, yet they probably used mules as pack animals in their earliest visits to the territory called Colorado. Prior to 1763 French traders from the Upper Mississippi were trading on the Arkansas River, probably near the site of Pueblo. Since goods were packed westward and exchanged for furs carried back, horses must have been used for the purpose, and packing methods were those of the Eastern Colonies.

The earliest pack-saddle was made of forked branches of trees, selected to fit as closely as possible the contour of the animal's body, and was fastened on with bands of deer-skin. The methods of the Spaniards from the South were different in that the saddle itself consisted of a rectangular pad of leather stuffed with hay and bound to the animal's back with an encircling cinch of woven grass. Both these types later were replaced by a built-up saddle of wood

which was almost an exact replica in small scale of the old fashioned saw-buck. With slight modification, this type still prevails where packing is practiced. When mules were used as pack-animals, especially in surface-broken territory, some means had to be employed for preventing the pack-saddle from working forward over the animal's shoulders, and the earliest method to accomplish the desired results consisted of the use of a crupper. Later this was replaced by a sort of breeching made of skin or fabricated material reaching around the animal's thighs and fastened to the sides of the saddle or its padding. With horses no such device was necessary.

Prior to the opening of trade relations with New Mexico at the end of the Spanish Dominion in 1821, traffic in furs was the only commercial transportation from Colorado. The beginning of transportation in the state may therefore properly be placed at the beginning of the nineteenth century, and at first the traffic consisted of furs moved eastward and crude articles of clothing, food and trappers' necessities westward. It was conducted by the use of pack-animals, both horses and mules being employed, and the first route followed generally the course of the Arkansas River east of Pueblo.

Almost contemporaneously with the beginning of transportation along the Arkansas, or at most only a few years later, the same kind of traffic found its way eastward and a similar exchange of traffic westward along the South Platte River. No record of the volume or value of such traffic has been handed down to us in anything like definite figures. In the year 1816 furs were packed from a camp on the Huerfano River to St. Louis. The route extended along the Huerfano to its junction with the Arkansas, thence along the latter stream eastward.

WHEELED VEHICLES

It was not until 1822 that wheeled vehicles were taken to Santa Fé, New Mexico, which at the time was the most populous community in the far West. When wheeled vehicles became common on the Santa Fé Trail they were also used in traffic to and from trading posts as far west

as Pueblo. Traffic on the Santa Fé Trail grew to such an extent in the period from 1822 to 1825 that "trains" of pack-animals, both horses and mules, became necessary, and thus is found the origin of the "pack train" which later became the common method of transportation in the mountains where it was impracticable to build roads for wheeled vehicles.

FIRST ROUTES

Prior to the use, in the third decade of the nineteenth century, of wheeled vehicles in the far West, which of course left a track to be followed by others, there were no fixed routes of travel. Pack animals could be driven anywhere, and while it was necessary to avoid wide departure from stream beds affording a supply of water for drink, yet transverse and diagonal routes were used following only trails left by deer and buffalo between feeding grounds or between summer and winter ranges. In the absence of definite knowledge of the uncharted region, these trails were usually safe against the possible failure of pasturage for domestic animals because of the unerring instinct of the native animal life. Such infrequent and desultory excursions as were made into the mountains followed the watercourses as the only practicable avenues of travel. Aside from the trails which followed generally the courses of the Arkansas and Platte rivers, only one other seems to have been used sufficiently to definitely establish its route. It is described by Irving Howbert as being in 1840 a well-worn pack trail which extended from Fort Saint Vrain on the north along the South Platte River through Fort Lupton to the mouth of Cherry Creek, thence along Cherry Creek and a tributary to the divide between the South Platte and Arkansas watersheds, whence it followed Jimmy Camp Creek and the Fountaine qui Bouille to the Arkansas, and then wound its way southward around the base of the Spanish peaks into Taos, New Mexico. Up to 1850 its use was confined to trade between the people of Taos and the Indians through the trading posts along the base of the mountains.

The volume and value of transportation to and from

Colorado proper before the "Pike's Peak Gold Rush" starting in 1858 was insignificant indeed, and local transportation within the confines of the territory wholly lacking. The Mormon migration to Utah in 1847 had served to more firmly establish the Platte River Route, which had long been the principal overland way from the Missouri River to the West and Northwest, and the gold rush to California in 1849 had permanently fixed the two great cross continent highways—the "Santa Fé Trail" and the Platte River route, or as it was later known, the "Overland Trail." Most significant is the fact as having the controlling influence on the development of transportation in Colorado that at the southeast corner of the state as afterwards defined, and likewise at the northeast corner, the one of these famous "trails" had detoured to the south and the other to the north, respectively, so as to leave Colorado soil practically untouched.

Political divisions of the Nation, even had they been suggested, were of little moment then as now in the advance march of civilization, but the obstacles interposed by Dame Nature in the configuration of the earth's surface still constitute the governing factor. The snowy ranges of the Rocky Mountains, or as they were known to the early pioneers, the Spanish Mountains, rising to unknown but apparently unattainable heights above the floor of the great plains and stretching for vast distances to the right and to the left directly across the path of progress, had formed the one great barrier impassable. Thus had come as it were the parting of the ways, and it was not until nearly half a century later that there was developed sufficient courage for attacking vigorously the apparently unsurmountable difficulties of penetrating the Colorado Rockies, and even then, it was the lure of hidden treasures as well as the mystery and romance involved in their discovery that afforded the necessary stimulant to action.

PIKE'S PEAK RUSH

The reported discovery of gold and the subsequent rush to the Pike's Peak region in 1858 makes that year stand out above all others as marking a distinct epoch in trans-

portation in Colorado, for prior to that time there were no regularly traveled routes or roads save the two great trails barely touching the easterly corners of the state and a kind of vaguely defined and infrequently used road previously mentioned connecting the two along the foot of the front range. Overland traffic on the two east and west routes by this time had grown to large proportions. On the Santa Fé Trail the growth of trade with Mexico from 1822 to 1843 has been closely estimated by Josiah Gregg in his *Commerce of the Prairies*.²

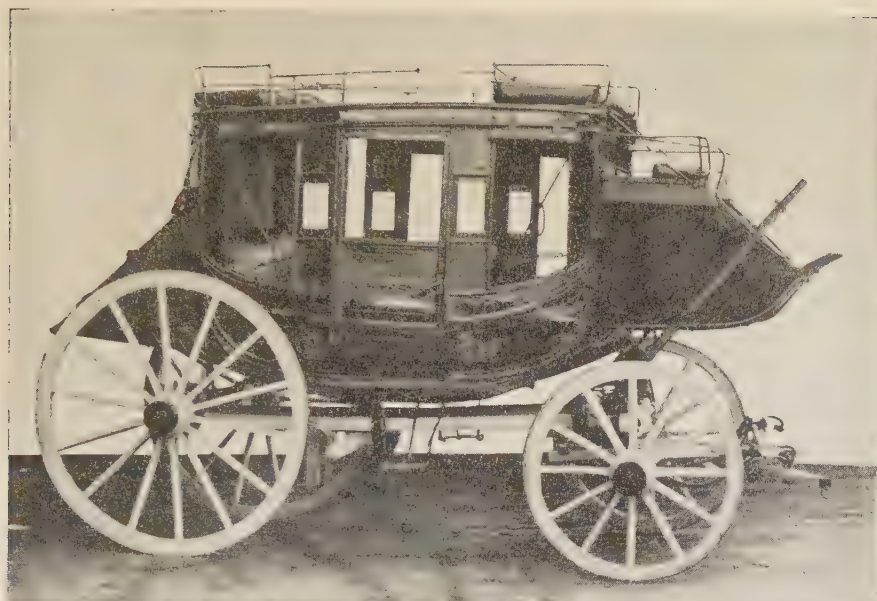
In 1849 regular monthly stagecoach service carrying United States mail from Independence, Missouri, to Santa Fé was initiated, but the records are not clear as to the exact route followed. It seems quite probable that at first this stage line did not traverse any part of Colorado. According to Bradley there were in 1850 in this and the

² Probable amounts of merchandise invested in Santa Fé trade from 1822 to 1843, and about the portion of the same transferred to Southern markets (chiefly Chihuahua) during the same period, together with approximate number of wagons, men, and proprietors engaged each year:

Years	Amt. Mdse.	Wgs.	Men	Pros.	T'n to Ch'a
1822	15,000		70	60	
1823	12,000		50	30	
1824	35,000	26	100	80	3,000
1825	65,000	37	130	90	5,000
1826	90,000	60	100	70	7,000
1827	85,000	55	90	50	8,000
1828	150,000	100	200	80	20,000
1829	60,000	30	50	20	5,000
1830	120,000	70	140	60	20,000
1831	250,000	130	320	80	80,000
1832	140,000	70	150	40	50,000
1833	180,000	105	185	60	80,000
1834	150,000	80	160	50	70,000
1835	140,000	75	140	40	70,000
1836	130,000	70	135	35	60,000
1837	150,000	80	160	35	80,000
1838	90,000	50	100	20	40,000
1839	250,000	130	250	40	100,000
1840	50,000	30	60	5	10,000
1841	150,000	60	100	12	80,000
1842	160,000	70	120	15	90,000
1843	450,000	230	350	30	300,000

freighting service about 500 wagons and 5,000 animals. Similarly the traffic had grown on the other route, or as it was known, the Central Route, from the first immigrant wagon in 1841, through the Mormon immigration in 1847 and the California Gold Rush in 1849, until in 1858, when the business of one firm alone—Russell, Majors and Waddell—necessitated 3,500 wagons, 40,000 oxen, 1,000 men, and 1,000 mules. All of the traffic up to this time had passed by, barely touching Colorado soil. The nearest rail head was east of St. Joseph, Missouri, the railway line being completed to that point in 1858. The Chicago and Northwestern had not yet reached Council Bluffs from Chicago, nor had the Missouri Pacific reached Kansas City from St. Louis.

Thus it occurred that gold seekers and home seekers had for ten years gone far afield without ever so much as a thought for the virgin territory close at hand by the way. Perhaps it was because of this fact that the reported discovery of gold in the Pike's Peak region gave such impetus to the closely following stampede. It was largely a matter of transportation too for people from the East and South flocked to the Rocky Mountains of Colorado. Even disappointed gold seekers from California returned thus far for better luck. Every kind of a burden-bearing and draft-animal and every sort of a conveyance were pressed into service. Previously circulated stories of the depredations of the wily and hostile plains Indians apparently had no deterrent effect on eager multitudes hurrying to the far West. Well traveled roads and beaten trails were ignored in the eagerness to tear away the vast expanse of the plains which separated the fortune hunters from their goal. It started late in 1858, and by Christmas there were several hundred people near the mouth of Cherry Creek. Immediately there arose from all points of the compass the hue and cry for transportation. The clamor was especially pronounced early in 1859. The organized stage, express and freight lines were unable to cope with the demand, and as a result there sprang up new companies, partnerships and individuals to supply transportation to the mountains, and still there were insufficient facilities and equipment to



THE CONCORD STAGECOACH
THE COVERED WAGON

provide for all who insisted on making the journey. Many families used their own stock and vehicles, and neighbors pooled their resources to cover the bare necessities of the trip.

FIRST TRANSPORTATION COMPANY

The first commercial transportation institution serving Colorado directly from the East was the Leavenworth and Pike's Peak Express plying between Leavenworth, Kansas, and Denver. The first coaches arrived in Denver May 17, 1859, after making the trip of 687 miles in nineteen days. After passing through Fort Riley the route followed generally the Republican Fork of the Kaw to its source, and thence extended across the plains drainage to Cherry Creek. The equipment consisted of fifty-two Concord Coaches and 1,000 mules, and stations were established at 25-mile intervals. This line also carried the first mail into Denver or Auraria, as it was then called, charging the addressee upon delivery twenty-five cents per letter and ten cents per paper for bringing them from Fort Leavenworth. The same rates were charged for mail taken back.

At first the freight transported consisted of the personal effects of the gold seekers and the necessities of meager existence, then followed manufactured goods used in housing, feeding and clothing those who had the courage to stay notwithstanding the disappointment in failing to find vast quantities of easily panned placer gold. Developments were rapid, however, and within the year 1859 there was hauled across the plains to Denver everything necessary for simple communal life. The first steam quartz mill was erected at Gregory Diggings, now Black Hawk, in September of that year, and within nine months it is said that 160 mills left the Missouri River for the Pike's Peak region. Howbert states that from 60,000 to 70,000 people went to the Rocky Mountains in 1860, and ninety per cent of them traveled the Platte River route. There were 11,000 wagons on the road between the Missouri River and Denver in May and June, 1860, and Hollister is authority for the statement that for one month of that year there was a single train extending from the Missouri River to the mountains.

But the great influx of wagons from the East by no means displaced pack-animals, for immediately on arriving at the base of the mountains, the terminus of the wagon trails, people scattered in every direction into the mountains prospecting for gold. Since there were no mountain roads and few trails, prospectors packed their beds, pick, shovel, placer pan, and grub on the back of some kind of an animal and made for the hills. In 1859 prospectors were in South, Middle and North Parks, and even over the range on the Blue River. Some came west via the Arkansas to the mouth of the Fountaine qui Bouille, and thence followed the latter around the base of Pike's Peak and over Ute Pass into South Park. Others proceeded on westward up the Arkansas to Canon City and thence over the divide to the headwaters of the South Platte. Still others went into and out of South Park to the headwaters of the Arkansas, thus avoiding the Grand Cañon of that stream just above Canon City. From the Cherry Creek terminus of the wagon trails the routes taken into the mountains spread out like a fan into Boulder Creek, the Clear Creeks, and the South Platte.

OVERLAND STAGE LINES

The pioneers in the overland traffic on a large scale were Messrs. Majors, Waddell and Russell, who in 1858, having obtained an important contract from the Government to transport supplies to Utah, combined to form the firm of Russell, Majors and Waddell. The "Butterfield Overland Mail," which was inaugurated in September, 1858, operating from Memphis and St. Louis to San Francisco through Missouri, Arkansas, Texas, New Mexico, Mojave Desert and San Joaquin Valley, was on account of the Civil War forced to discontinue operations, March 12, 1861, and the equipment was transferred to the Central Overland route, St. Joseph to Placerville, California, via Fort Kearney, Fort Bridger and Salt Lake, daily service thereon being initiated in July, 1861. Meanwhile "The Leavenworth and Pike's Peak Express," established early in 1859 by Russell, Majors and Waddell in combination with Jones and Cartwright, had been merged soon after its organization to form the Central Overland and Pike's Peak

Express Company, which took over the "Butterfield Overland Mail" contract and equipment as far as Salt Lake two years later. In the summer of 1860 the Western Stage Company started a line of coaches plying between Denver and Omaha via Fort Kearney. Early in 1862 the Central Overland, California and Pike's Peak Express came into the possession of Benjamin Holladay and associates through foreclosure sale, and in the summer of 1862 the Western Stage Company was absorbed by the same interests, thus leaving the "Holladay Overland Mail and Express Company" in sole possession of the field.

On July 5, 1864, Col. David A. Butterfield established "Butterfield's Overland Dispatch," a fast freight line operating from Atchison to Denver via Topeka over what was then the "New Smoky Hill" route. This was the shortest route from the Missouri River to Denver, and when in 1865 stagecoaches were put on the line it was known as an "Express and Fast Freight Line." Shortly after its incorporation on January 20, 1866, by the Colorado Territorial Legislature of the operated line and a proposed extension to the Utah border, the Butterfield Overland Dispatch Company also came into the possession of the "Holladay Overland Mail and Express Company," which was not legally incorporated in Colorado until February 5, 1866. Still later in the same year Wells Fargo and Company, a Colorado corporation, acquired the entire holdings of the Holladay Company, consisting of 3,300 miles of owned and controlled roads.

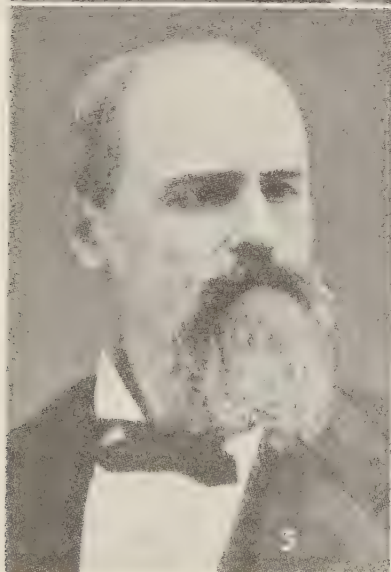
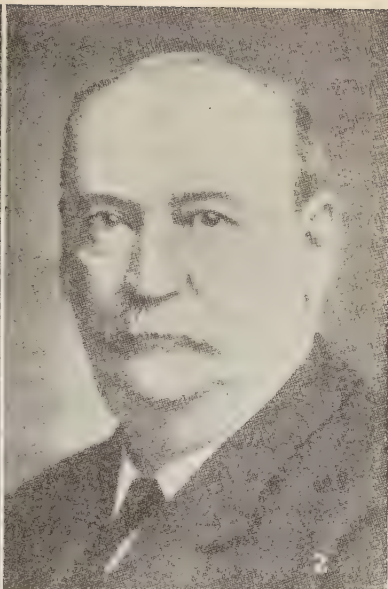
All the overland lines east of Denver were short lived, however, for by 1867 the rail heads of the Union Pacific and Kansas Pacific railroads were at Cheyenne, Wyoming, and Ellsworth, Kansas, respectively, and in 1870 Denver had rail connections with the East via the two routes. Thus the strictly Colorado overland traffic dates from 1859 to 1870, and while it was being carried on, wagon roads and beaten trails were gradually extended into the mountains. In 1859 expresses were run by Castro and Shepherd over almost impassable roads between Denver and Central City (Gregory Diggings), and operations were continued by these proprietors until the spring of 1860. Hinckley & Company also started a mail and express line about the

same time. On March 4, 1860, the first coach of Kehler & Montgomery's Express arrived at the mines from Denver via the Golden Gate-Dory Hill (Ralston Creek) route. In May, 1860, Sowers & Company started a line of coaches, and in June the Western Stage Company began operations, but it was not until August that the first regular United States mail service was extended into the mountains.

The famous Pony Express, instituted in April, 1860, for carrying fast mail between the Missouri River and California, used the Platte River route, and therefore broadly speaking did not come into Colorado. Important messages for Denver were carried by the Pony Express to Julesburg, and thence transported thither on regular stage coaches. News of lesser importance came by regular coaches all the way from the Missouri River. The news of Lincoln's election came by Pony Express, leaving St. Joseph on the afternoon of November 8th. It was published in the *Rocky Mountain News*, November 13th. Weekly mail service was established between Denver and Pueblo in 1862.

Telegrams to and from the East were transmitted by stagecoach between Julesburg and Denver until the fall of 1863, when a telegraph line between Julesburg and Denver was completed to a connection with the Transcontinental Line, which had been finished two years previously. This branch pole line between Julesburg and Denver ran via Fort Morgan and the "Cutoff," which in the same year had been established by Holladay for the overland stages.

While the "rush" of '60 was great, the traveling and freighting seasons of the following two years, 1861 and 1862, passed by with an entirely different story to record. The War of the Rebellion drew so heavily of men, animals, equipment and supplies from the overland traffic as to leave a relatively small proportion of what had theretofore been engaged in it. The season of '63 was even worse, for coupled with the conditions brought about by the war were the handicaps resulting from a long and severe drought during which flowing streams ran out and feed crops were burned up by a scorching sun. This was followed by so long and severe a winter and then such an unprecedented season of spring floods that it was not until later in 1864 that transportation began to assume proportions consistent



PROMINENT FIGURES IN COLORADO TRANSPORTATION

1. William J. Palmer.
2. David H. Moffat.
3. Ben Holladay.
4. Otto Mears.

with other developments. To make matters worse, if that were possible, the Indians on the plains went on the war-path, intercepting all traffic for a period of two months before coercive measures could be made effective, and even so, the backwash of Indian tactics after primitive government action resulted in a further cessation of overland transportation for a two months period in the winter of 1864-1865.

EARLY TOLL ROADS

In the meantime roads were being completed into the mountains, so that by the close of the war and resumption of overland traffic from the East there were many avenues opened to the mountain mining districts and settlements. Prior to the legal incorporation by territorial legislative acts, the Denver, Auraria and Colorado Wagon Road Company was organized to build a toll road from Denver via South Park to "Saratoga West," now Hot Sulphur Springs. The road was opened in December, 1859, to Bergen Park, and in the spring of 1860 to Tarryall. Another company was formed to build a toll road from Auraria by way of Bradford and Piedmont to South Park. The St. Vrain, Golden City and Colorado Wagon Road Company was organized to build from Fort Saint Vrain via Golden City to Saratoga West. This road was completed to Mount Vernon in the fall and through Bradford to Tarryall the following year, 1860.

In the decade, 1860-1870, and prior to the general legislative act authorizing and prescribing procedure for the incorporation of toll roads, there were forty-three such institutions incorporated by specific acts of the territorial legislature. The roads described varied from two or three miles to 150 or 200 miles in length. Some companies by their incorporation were authorized to collect tolls on roads which they had previously constructed, and others were authorized to construct and operate toll roads over the routes described in their incorporation. Some of the latter were constructed in entirety, others only partially built, and still others never progressed beyond the paper stage.

Generally the tolls authorized varied from 50 cents to \$1.00 for each vehicle drawn by a single span of animals,

depending upon the length of road over which toll was charged, with usually 25 cents for each additional span of animals attached to a vehicle and lesser amounts for a single riding animal or each animal of a herd driven loose. The tolls authorized for the Central City and Georgetown Wagon Road Company are quite typical of all, and are quoted as follows:

Each wagon drawn by one span of horses, mules, or cattle, the sum of 75 cents.

Each additional span of horses, mules, or cattle to each wagon or vehicle, the sum of 25 cents.

Each riding horse or mule, the sum of 10 cents.

Horses, mules, cattle and asses, driven loose, the sum per head of five cents.

All sheep driven on the road, the sum per head of one cent.

All wagons and vehicles of any kind passing down upon said road or in the direction of Central City, only one-half of the above rates of toll shall be collected.

Another quite general provision in these early toll road corporations was that parties passing over the road to attend religious services or those traveling to or from attendance at funerals would be exempt from toll charges.

The routes adopted for these roads are indicated by their names which, together with the date of incorporation, are of more than passing interest:

1. Enterprise Wagon Road Company, October 3, 1861 (Michigan House to Gregory Diggings).
2. Denver, Bradford and Blue River Road Company, October 11, 1861.
3. Apex and Gregory Wagon Road Company, October 11, 1861.
4. Canon City, Grand River and San Juan Road Company, November 6, 1861.
5. Colorado and Pacific Wagon, Telegraph and Railroad Company, November 6, 1861. (Eastern Boundary of Colorado, via Denver, Berthoud Pass, Middle Park, Gore's Pass, and White River to Western Boundary.)
6. Park Junction, Georgia and French Gulch Road Company, November 6, 1861.
7. Central City and Georgetown Wagon Road Company, November 7, 1861.
8. St. Vrain, Altonia, Boulder Mines, and Gregory Wagon Road Company, November 7, 1861.

9. Bear Canon Road Company, November 7, 1861.
10. Breckenridge, Buckskin Joe and Hamilton Wagon Road Company, November 8, 1861.
11. Ute Pass Wagon Road Company, August 8, 1862.
12. Tarryall and Arkansas River Wagon Road Company, August 14, 1862.
13. Fremont Orchard Plank Road and Turnpike Company, August 14, 1862.
14. Golden Gate and Gregory Road Company, August 15, 1862.
15. Currant Creek and Arkansas River Road Company, August 15, 1862.
16. Idaho and Missouri City Wagon Road Company, August 15, 1862.
17. Clear Creek Wagon Road Company, August 15, 1862.
18. Empire City, New Pass, Breckenridge and Montgomery City Road Company, August 15, 1862.
19. Clear Creek and Guy Gulch Wagon Road Company, March 8, 1864.
20. Denver and Pacific Wagon Road Company, March 10, 1864. (Empire City to Western Boundary of Colorado.)
21. Central City and Idaho Wagon Road Company, March 11, 1864.
22. Central City and Montgomery Wagon Road Company, March 11, 1864.
23. Boulder Valley and Black Hawk Wagon Road Company, March 11, 1864.
24. Denver, Turkey Creek and South Park Road Company, February 8, 1865.
25. Boulder Valley and Central City Wagon Road Company, February 8, 1865.
26. Russell Gulch and Nevada Wagon Road Company, February 8, 1865.
27. Colorado and Clear Creek Railroad Company, February 9, 1865.
28. Trinidad, Ratoon (Raton) Mountain Road, February 10, 1865.
29. Overland Wagon Road Company, February 10, 1865. (Denver to Western boundary of Colorado via Boulder and Arapahoe or Boulder Pass.)
30. Denver and San Luis Valley Wagon Road Company, February 10, 1865.
31. Butterfield Overland Dispatch Company, January 20, 1866. (Denver via Cherry Creek, Bijou Basin, and Cheyenne Wells to Eastern boundary of Colorado.)
32. Hamilton and Montgomery Wagon Road Company, January 27, 1866.
33. Denver and Turkey Creek Wagon Road Company, February 1, 1866.
34. Overland Wagon Road Company, February 5, 1866. (Western Boundary of Colorado via White River and Berthoud Pass to connection with Denver and Pacific Wagon Road.)

35. South Park, Blue River and Middle Park Wagon Road Company, February 5, 1866.
36. Middle Park and South Boulder Wagon Road Company, February 6, 1866.
37. Ni-Wot and Black Hawk Wagon Road Company, February 6, 1866.
38. Frankstown and Gile Station Wagon Road Company, February 9, 1866.
39. Consolidated Wagon Road and Bridge Company of Colorado, January 11, 1867. (Denver to Ft. Morgan and Cheyenne Wells.)
40. Colorado and California Wagon Road Company, January 11, 1867.
41. Gore's Pass and White River Wagon Road Company, January 11, 1867.
42. Georgetown and Breckenridge Wagon Road Company, January 11, 1867.
43. Smoky Hill, Arkansas and Purgatoire Wagon Road Company, January 11, 1867.

After the enactment by the territorial legislature of the statute prescribing the method of procedure for the incorporation of toll roads and the regulation of the operations thereof, numerous roads were built in various sections of the mountains where there was any demand for transportation. The filing records of these have been scattered, and are not now available. It is therefore apparent that up to the time of the first strictly Colorado railroad construction in 1870, there was a network of wagon roads in the mountains, especially in that portion immediately west of Denver.

OVERLAND TRAFFIC

In the overland traffic across the plains east of Denver the first wagons used for the transportation of freight were known as Murphy wagons, the predominating characteristic of which consisted in large, solid wooden wheels. The Conestoga wagon later became prevalent in the plains traffic, and due to its boat-shaped body, was the origin of the sobriquet "Prairie Schooner." Oxen were generally used in this traffic in preference to mules for the reason that these animals required the carrying of less feed while en route, dependence being placed on grass along the way for the principal part of their sustenance. Then again, it was stated that the larger hoofs of the cattle made travel-

ing easier with oxen than with mules over the long stretches of sandy road. Each wagon carried from three to three and one-half tons of load, and were drawn by six yoke of cattle which were universally known as bulls and their driver as a "bull whacker." The driver walked on the left-hand side of the team, and carried a long whip fastened to the end of a short handle. Ordinarily for mutual assistance and safety about twenty-five wagons were grouped in a train which traveled on an average of twelve to eighteen miles a day.

Records of the volume of freight transported across the plains are meager because of the large number of freighters engaged in the business. Moreover, only obscure data are available as to the segregation of the overland traffic between that destined to Colorado and that which moved to Salt Lake City and the Pacific Coast. In 1865 more than 10,500 tons were shipped from Atchison, and it is quite probable that practically all of this came to Colorado. According to W. L. Visscher in his history of the Pony Express the average rates per pound between Atchison and Denver were as follows:

Flour, 9 cents; sugar, 13½ cents; bacon and dry goods, 15 cents; whisky, 18 cents; glass, 19½ cents; trunks, 25 cents; furniture, 31 cents.

Vehicles used in passenger traffic were principally Concord coaches with four or six mules as the motive power. Coaches invariably carried mail and small packages of express. There were seats for nine passengers inside and five, including the driver, on top. Personal baggage to the extent of about twenty-five pounds was customarily permitted for each passenger. In 1863 passenger fare from Atchison to Denver was \$75.00, which in 1865 was increased to \$175.00.

It is here necessary to diverge and direct attention to rail transportation. Not that with the close of the 1860-1870 decade animal motive power was any the less important to the development of the State, as will afterwards be made apparent, but because with the close of this first period there followed an evolution of animal transportation so closely associated with rail traffic as to make the two interdependent.

TRANSCONTINENTAL RAILROAD SURVEYS

Recognition of the advantages of some sort of a route across the North American Continent dates almost back to the landing of Columbus. The desirability of a cross-continent route of trade with the Orient and communication between the Atlantic and Pacific was made manifest in different ways and during their tenure of control by all those nations who have ever had possessions in America. The earlier ideas were of course for the utilization of water routes, and even long after the invention of the steam locomotive the prevailing skepticism as to the eventual practicability of steam rail transportation made it indeed a bold and visionary suggestion that incorporated any substantial length of rail route in combination with waterborne transportation. The first printed suggestion of an all rail route across the continent was issued early in 1832 when there were in operation only 100 miles of railways in the entire United States, and the author of the expression rather timidly voiced the opinion that the scheme be undertaken as a national project. By 1840 the idea itself was tolerably well crystalized in public opinion, but the ways and means were vague and obscure. The credit for obtaining at last some official action by the United States government, though not quite the sort he anticipated, belongs to Asa Whitney, who brought forth the first definite plan of conducting the undertaking and through whose perseverance inspired by patriotic and philanthropic motives Congress years afterward was finally moved to take at least one decisive step preliminary to consummation of the plan.

Neither space nor propriety will permit an account of the struggle both within and without congressional sessions to obtain governmental aid in the construction of a railway to the Pacific. We are here only concerned in certain phases of the matter never heretofore held to be of much importance but which in a retrospect appear now as of vital influence in shaping the course of rail transportation in Colorado. Moreover, a full and complete account of what transpired is already recorded in official documents and in the writings of eminent authorities on the subject.

At the time of the first definite proposal made to

Congress by Whitney in 1844, little was known of the Colorado Rockies. To be sure there were extant the reports of the explorers such as Pike, Long, and Frémont, and but one of these had conducted explorations after the inauguration of railways in the United States. Even Frémont, who on his several expeditions was much concerned with the mountains of Colorado, had no specific official commission to look for a practicable railway route though he doubtless did so of his own volition, especially in his later trips. In the early forties only one route to the Pacific was available, the Oregon Trail. True the Santa Fé Trail was used to New Mexico, but beyond lay the territory of an alien power. Oregon alone was therefore the objective. Small wonder then that the Oregon Trail offered the sole route without question. But with California in the Union and the concessions obtained at the close of the war with Mexico, another factor was injected into the problem. There were now two Pacific Coast objectives and two routes for their attainment—viz., the Oregon Trail and the Santa Fé Trail, for the old Spanish Trails beyond Santa Fé could now be used.

The Mormon migration to Salt Lake in 1847 and the California gold rush of 1849 served to focus favorable sentiment for and accentuate the practicability of a direct central route to California as well as a route to Oregon. Advocates of the southern routes had, however, sufficient influence to prevent adoption of any of those farther to the north, so that up to the beginning of 1852 Congress had been pressed to take some definite action on one of a half-dozen routes and about as many plans for construction of the railroad. We are interested in but one of these, that proposed by Senator Thomas H. Benton of Missouri in a bill introduced in the Senate in 1850. The route, rather vaguely described by Senator Benton and by him considered practicable, was doubtless suggested as a result of the explorations of his son-in-law, John C. Frémont. As proposed it extended from St. Louis to San Francisco via the main branch of the Kansas River, the Arkansas River, and the Huerfano River to some pass called Utah Pass leading to the headwaters of the Rio del Norte about 3° of latitude south of South Pass, and thence on to the Great Basin. The

other routes which had been proposed passed some to the north and others to the south of Colorado.

Near the close of the session of 1852-53, weeks of which had been devoted to the discussion of the Pacific Railway measure, an amendment to the army appropriation bill in the way of two additional sections authorizing surveys finally passed both houses, March 1, 1853, thus consummating an action that should have been taken at the beginning of an eight year period of ceaseless agitation and discussion. The two sections read as follows:

SECTION 10. And be it further enacted, That the Secretary of War be and he is hereby authorized, under the direction of the President of the United States, to employ such portion of the corps of the topographical engineers, and such other persons as he may deem necessary, to make such explorations and surveys as he may deem advisable, to ascertain the most practicable and economical route for a railroad from the Mississippi River to the Pacific Ocean, and that the sum of one hundred fifty thousand dollars or so much thereof as may be necessary be and the same is hereby appropriated out of any money in the Treasury, not otherwise appropriated, to defray the expense of such explorations and surveys.

SECTION 11. And be it further enacted, That the engineers and other persons employed in said explorations and surveys, shall be organized in as many distinct corps as there are routes to be surveyed, and their several reports shall be laid before Congress on or before the first Monday in February, eighteen hundred and fifty-four.

Acting in accordance with this authorization the Secretary of War, Jefferson Davis, organized parties for the survey of four primary routes; the Northern, between the forty-seventh and forty-ninth parallels; the Central, between the thirty-seventh and thirty-ninth parallels; the thirty-fifth parallel route; and the thirty-second parallel route. It is quite likely that in considering the matter of routes to be surveyed the Secretary of War was influenced in naming the Central route as one to be investigated by the reports of Frémont's previous expeditions.

It is to be observed that no separate party or corps of engineers was organized for the survey of the forty-second parallel route, variously known as the "Overland Route," the "Central Route," "Emigrant Trail," and "Mormon Trail." Doubtless the War Department felt that

since the country in which it lay had been explored and described by Frémont and that portion of the route east of Fort Bridger had been surveyed in 1849 and 1850 by Captain Stansbury, it would answer every purpose to include the investigation of that portion west of Fort Bridger with the survey of the thirty-seventh to thirty-ninth parallel route, the one in which we here are exclusively concerned.

GUNNISON SURVEY

The instructions of the War Department, dated May 20, 1853, directed Captain J. W. Gunnison to start from Fort Leavenworth and proceed with his party and its military escort thence to the Huerfano River, making en route such reconnaissances as would determine the practicability of a railroad across the plains and connections with eastern lines of commerce, also to continue with more minute detail "up the Huerfano into the San Luis Valley, and thence through the most eligible pass to the valley of the Grand River, and westwardly into Utah."

On June 23, 1853, Captain Gunnison set out from West Port and joined his assistant Lieutenant E. G. Beckwith on the Arkansas River at the ninety-ninth meridian. The united party followed the Arkansas to the mouth of the Apishapa, erroneously thought to be the Huerfano—an error, afterwards discovered and corrected. The party followed up the Huerfano crossing the range via Sangre de Cristo Pass into the San Luis Valley. After a delay in obtaining a guide from Taos it proceeded northward along the valley and up Saguache Creek to Cochetopa Pass, exploring several passes in the Sangre de Cristo range, none of which, however, seemed practicable for railroad use. One of these, negotiated by Captain Gunnison himself, was, owing to the enthusiasm the Captain displayed in its discovery, named "Gunnison Pass" by Lieutenant Beckwith, but afterwards called "Puntia Pass" and still later "Poncha Pass," by which name it is now known. Owing to the altitude of Cochetopa Pass a long tunnel was thought to be necessary, but the descent therefrom via Cochetopa Creek to the Tomichi and thence via that stream to the

Gunnison River (mistakenly thought by the Captain to be the Grand) offered no serious difficulty.

The Black Canon of the Gunnison was avoided by keeping up on the mesas south of that stream and crossing over the divide into the Uncompahgre Valley which leads back into the Gunnison at a point where Delta now stands far below the cañon. The mesa portion of the route was considered so difficult as to elicit a report that if practicable at all the line of railroad would have to follow the cañon. The lower reaches of the Gunnison were found to be entirely practicable, and the stream was followed to its confluence with the Colorado (erroneously called the Blue by Captain Gunnison).

West from Grand Junction the route followed the Grand to the mouth of Salt Creek (reported as Bitter Water Creek), and thence via the latter and one of its tributaries to the Colorado-Utah border, this detour from the river being necessary to avoid Ruby Canon. From this point on the border, which was about twenty miles north of the river, the course lay generally west across the Utah desert to the Green River, crossing this stream near the present town of Green River, Utah.

We need follow Captain Gunnison no farther. The objective of the Central route survey was Salt Lake City, there to be connected with a survey to California which was understood to be in progress by the Mormons, but the ultimate objective was never attained by Captain Gunnison. Together with seven of his men he was brutally murdered by Indians near Sevier Lake, October 26, 1853. After his death, Lieutenant Beckwith took charge of the party, carried out the task, and reported on the thirty-eighth and thirty-ninth parallel route for the Pacific Railway.

PACIFIC RAILROAD

The results of the Federal Government surveys of 1853-1854 served only to increase the confusion and uncertainty of public opinion and to render a congressional decision more difficult of attainment, for the explorations and investigations had shown that several routes were practicable. Therefore, in the following seven or eight years all sorts of

schemes were proposed in the form of bills introduced in the several succeeding sessions of the Congress. Sectionalism and diversity of opinion as to how far the national government should go in lending aid to the project, as well as the reluctance to act in any matter involving precedents as to the sovereign rights of states interested, served to confuse the whole issue. Although almost constantly pressed for action during the interim, and despite conscientious efforts on the part of most of the senators and representatives, it was not until July 1, 1862, that an approved bill was signed by President Abraham Lincoln providing for the creation of "The Union Pacific Railroad Company."

But even up to this time the line of road had not been definitely located, the act providing for a railroad and appurtenances from a point to be fixed by the President of the United States on the 100th meridian in Nebraska between the south margin of the Republican River Valley and the north margin of the Platte River Valley via the most direct, central, and practicable route through the territories to the western boundary of Nevada, there to connect with the Central Pacific Railroad of California, with branches from the initial point on the 100th meridian, (a) to the western boundary of the State of Iowa; (b) to Sioux City or from the Iowa branch (a) to that place, whenever there should be a line of railroad completed thereto through Minnesota or Iowa; (c) to a connection with the Pacific Railroad of Missouri (now the Missouri Pacific) at the mouth of the Kansas River, to be constructed by The Leavenworth, Pawnee and Western Railroad Company (afterwards the Kansas Pacific) a Kansas corporation; and (d) via Atchison to St. Joseph, an extension of the Hannibal and St. Joseph Railroad.

BERTHOUD PASS SURVEY

The year previous to the passage of the Pacific Railroad act a party under James Bridger and Captain E. L. Berthoud, after traversing a route for a wagon road from Denver to Salt Lake via Berthoud Pass, Hot Sulphur Springs, Yampa River, White River, Uintah Basin, and Provo, had reported that a good wagon road could be easily,

cheaply, and quickly built along the route. Disappointed in that the Overland Mail Company could not be prevailed upon to use this route between Denver and Salt Lake City, The Colorado and Pacific Wagon, Telegraph and Railroad Company was incorporated November 6, 1861, by the Colorado Territorial Legislature, and preliminary railroad surveys financed by popular subscription were made in July, 1862, by F. M. Case, who reported the grade prohibitive and the altitude of the pass such as to necessitate tunneling thereunder on account of snow conditions.

The Federal Act of July 1, 1862, creating the Union Pacific Railroad Company, did not, however, produce the desired result in the way of inducing construction of the line. By it the aid to be given the project by the Federal Government was not sufficiently attractive to obtain the additional necessary investment and the coöperation of financiers, contractors, and practical railway men. For two more years the scheme lay dormant, and on July 2, 1864, President Lincoln signed the amended act under which, with minor alterations, the first transcontinental railroad became a reality, and which incidentally only, gave Colorado its first railroad.

KANSAS PACIFIC SURVEYS

By the Act of 1864, The Leavenworth, Pawnee and Western might connect with the Union Pacific at a point west of the 100th meridian, but if it elected so to do, it would receive from the federal government no greater subsidy of lands and bonds. Immediately thereafter the plans of the Leavenworth, Pawnee and Western (Kansas Pacific) were changed and construction started on a direct route to Denver, which it reached August 15, 1870. Once relieved from the apparently onerous condition of making a connection with the Union Pacific Railroad on the 100th meridian in Nebraska, the Kansas Pacific people began to see objectives other than that of simply reaching Denver as a western terminus. When the track had reached Sheridan, a short distance east of the Colorado-Kansas border, in July, 1867, extensive surveys were conducted by General William J. Palmer, then Manager of Surveys for the Kansas

Pacific, looking towards an extension of the line from the end of the track already in place to San Francisco and San Diego. Two general routes were compared, known as of yore the 35th and 32nd parallel routes. The surveys were made with much more precision and detail than were the federal surveys fourteen years earlier. In his magnificent report of December 1, 1868, General Palmer strongly recommends the 35th parallel as preferable to the 32nd parallel route to reach both San Francisco and San Diego, and shows that via the former the distance from New York to San Francisco would be less than via Omaha and the Union Pacific, while the distance from New York via Kansas City and the Kansas Pacific to San Diego would be 300 miles less than New York to San Francisco via the Union Pacific.

We are here interested in the lines investigated east of Albuquerque, a point common to both routes, and particularly interested in General Palmer's favorite route to reach Albuquerque from the end of the track at Sheridan, Kansas. Notwithstanding his Cimarron route leaving the constructed line at Ft. Harkness was "altogether the most advantageous for through business"; the Aubrey route leaving the constructed track at Ft. Hayes ranked next in advantage as a through line; and the Raton route utilizing the entire mileage already constructed was the shortest of all; yet owing to the prospects for local traffic throughout its extent, the Puntia (now Poncha) was singularly favored although it was the longest of the four. Neither the Aubrey nor the Cimarron routes touched Colorado. The Raton and Puntia routes were identical throughout an almost direct course from the end of the track at Sheridan to Ft. Lyon on the Arkansas, with a so-called branch from Cheyenne Wells, Colorado, to Denver. From Ft. Lyon the Raton route extended southwesterly and passed out of the state at the 104th meridian.

Although an alternate route into the San Luis Valley via the Huerfano River and Sangre de Christo Pass (the Gunnison route of 1853) was surveyed and reported on, it was considered impracticable on account of excessive gradients. The Puntia route closely followed the Arkansas River from Ft. Lyon through the "Big Canyon" (the Royal Gorge) to the forks of the Arkansas (Salida), and thence

ascended the smaller branch (South Arkansas), crossing into the San Luis Valley over Puntia Pass (the Gunnison Pass of 1853), whence it traversed the San Luis Valley southerly to the Rio Grande del Norte (at Alamosa) and closely followed that stream to Albuquerque. An advantageous deviation from this route was suggested in crossing the Rio Grande (at Alamosa), keeping to the flat and open mesas lying to the west of the river, and regaining the narrow Rio Grande valley at the mouth of the Rio Chama in New Mexico. In discussing the traffic possibilities of this route General Palmer dwells (this was in 1868) on the natural resources, especially mineral, directly tributary to the line, and mentions as particularly attractive the vast San Juan region lying west of and tributary to that portion of the route within the San Luis Valley. He also emphasizes the advantage of a branch line from the forks of the Arkansas (Salida) extending thence northward along the main branch of the stream and over an easy pass which he calls Arkansas Pass (now Tennessee Pass) to reach the Grand River country and to develop mineral resources then known to exist near the sources of the Arkansas and along the westerly margin of South Park.

A strong appeal was made for federal aid for this 35th parallel project of the Kansas Pacific Company, but regardless of its merits and the soundness of the scheme, all efforts were futile, and construction proceeded on the main route to Denver.

FIRST COLORADO RAILROAD

Colorado railroads may properly be said to date from 1870. For awhile it is true that the Union Pacific had been previously built across the extreme northeast corner of the state, the Kansas Pacific was then pushing ahead westward from the Kansas border, and both had thus shortened the plains overland traffic, yet rail transportation within the state confines was until then unknown. The Denver Pacific Railroad and Telegraph Company was incorporated in November, 1867, by a group of prominent Denver citizens to construct a line of railroad between Denver and Cheyenne, the nearest station on the Union Pacific. Its first president was General Bela M. Hughes. The movement was

largely to forestall the building of line between Golden and Cheyenne promoted by Golden interests and encouraged by the Union Pacific. Negotiations were had with both Union Pacific and Kansas Pacific in an effort to obtain aid in the undertaking, but their demands were so exacting as to be impossible of fulfillment.

On March 3, 1869, a congressional bill was approved whereby the land grants of the Kansas Pacific were transferred to the Denver Pacific which by this time had about completed its roadbed ready for the track structure. Upon the refusal of Durant and Dillon, Union Pacific contractors, to fulfill a contract with the Denver Pacific to complete the construction of the local road, Governor John Evans personally accepted the obligation of finishing the project, and with the co-operation of Robert E. Carr of the Kansas Pacific, pursuant to a contract with that company, consummated the first railroad undertaking in Colorado. Grading was started May 18, 1868, the first train moved Cheyenne to Evans (near Greeley) December 16, 1869, and the Denver Pacific was opened for business between Cheyenne and Denver, June 24, 1870. Construction forces employed on the Denver Pacific were immediately transferred to the building of the track on the Kansas Pacific eastward from Denver to meet those working westward from the Kansas border. The first train arrived in Denver via the Kansas Pacific, August 15, 1870, thus opening two rail routes of travel and trade with the outside world.

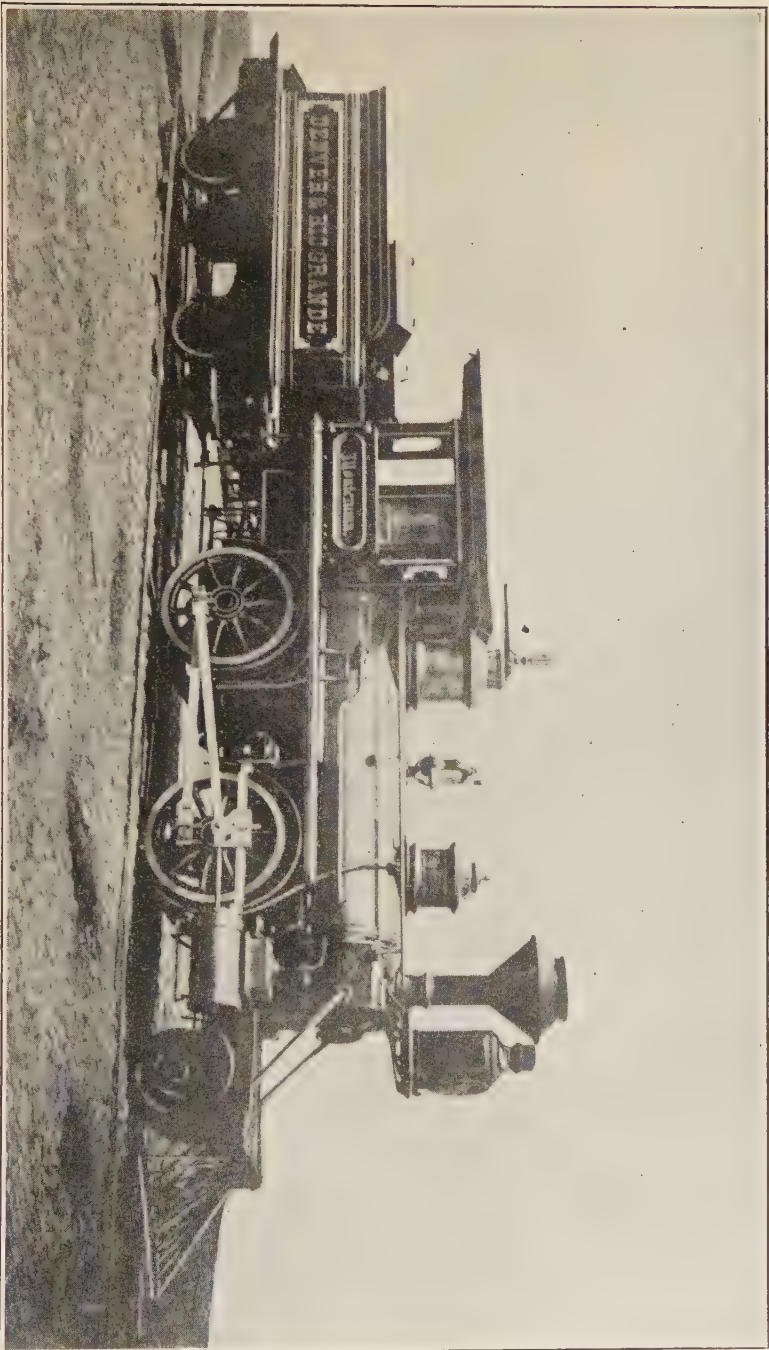
In the meantime another railroad was in the course of construction, and one which had served as much as any other influence the hastening to completion of the Denver Pacific. Through the aid of bonds issued in its behalf by Jefferson County, the Colorado and Central Railroad Company, originally incorporated by the Territorial Legislature in 1864 and amended thereby in 1865, completed a branch line of road connecting Denver with Golden, December 23, 1870. The Colorado and Central, promoted by Mr. W. A. H. Loveland and associates, as originally incorporated contemplated building Golden to Empire and Central City, Golden to Boulder, and Golden to Bijou Basin via Denver. When in the following year its amended incorporation as the Colorado and Clear Creek Railroad proposed the con-

struction of an additional line to the Cache la Poudre, presumably to connect Golden directly with the Union Pacific, leaving Denver by the wayside, energies of Denver citizens were aroused in an effort to prevail upon the Union Pacific to at least build a branch into Denver if the main line passed by on the north. Failure of this effort precipitated the building of the Denver Pacific with local capital.

A third strictly Colorado railroad, the construction of which closely followed the first two, was the Boulder Valley, extending from Hughes Station (Brighton) on the Denver-Cheyenne line to Boulder, and promoted by largely the same men interested in the Denver Pacific. The Boulder Valley Railroad was completed January 24, 1871. In 1870 tolls exacted for the carriage of freight from Omaha, Leavenworth, or Kansas City to Denver were \$2.60 per cwt. on merchandise, \$2.00 per cwt. on second class freight, \$1.75 on third class, and \$1.40 per cwt. on fourth class. It cost \$9.10 to send a ten-word telegram from Denver to New York, \$9.25 to Boston, and \$7.50 to Chicago or St. Louis.

DENVER AND RIO GRANDE

The fourth and greatest of all Colorado railroads had its inception October 27, 1870, when the certificate of the Denver and Rio Grande Railway, incorporated under the statutes of the Territory, was filed with the Territorial Secretary. The history of this railroad is so inseparably linked with the growth and development of the commonwealth as to demand more than passing reference in the narrative of the state. Aside from the boldness of the original undertaking which merits an important place in the annals of the transportation industry, the Denver and Rio Grande must be accorded first place because of its unique position as a railroad. The conception of the project is to be credited solely to General William J. Palmer, who undoubtedly formed his conclusions in the matter while he was engaged in conducting transcontinental surveys for the Kansas Pacific in 1867 and 1868. The general idea of the projectors was to build a trunk line beginning at Denver and terminating at the City of Mexico, the capital of the Mexican Republic. Branches were contemplated from points on this trunk line



(Courtesy of the Denver & Rio Grande Western Railroad)

FIRST LOCOMOTIVE USED ON THE DENVER & RIO GRANDE RAILROAD

wherever found convenient extending into the mountainous territory lying adjacent on the west, even as far as Salt Lake City, the center of Mormon population in the Great Basin. Since the route was quite clearly defined along the Rio Grande del Norte, after reaching some objective point on that stream, to El Paso, and thence to the City of Mexico, it was concluded that the most difficult portion of the undertaking would be the opening of a thoroughfare over the front ranges to the drainage area of the Rio Grande. It was natural, therefore, that the name should indicate the initial point and at least one of the principal objective points to be reached—hence the designation of the project as the Denver and Rio Grande.

A perusal of the articles of incorporation very succinctly emphasizes the fact that the country to the west of the main trunk line was even then virtually unknown and unexplored. The descriptions of such branch lines as were included in the original incorporation articles were very general indeed, and leave a correct impression that the whole country to the west was veiled in an atmosphere of mystery. Practically the entire territory to be traversed by the proposed line was public domain. Right of way could not be purchased, neither were there any federal statutes by which a right of way could be confirmed to a railroad. As a result of the efforts of the original promoters a special law was enacted by the National Congress on June 15, 1872, confirming to the Denver and Rio Grande the right of way 200 feet wide in public domain. Most of the provisions of this law were later incorporated in the general right of way act of 1875.

Partially because of the difficulty in obtaining funds for the project there was resorted to the novel expedient of adopting a narrow gage for the track. The gage of the Pacific railroads had been fixed by federal statute, March 2, 1863, at 4' 8½". As late as 1866 there were not less than twelve different gages on the railroads of America, varying from 4' 3" to 6' 0". The assurance of economy in adopting for the Denver and Rio Grande a gage of 3' 0", coupled with the confident conclusion that the standard gage, 4' 8½", was impracticable and in certain cases impossible for serving a territory consisting of the most precipitate mountain

region within the confines of the nation, lead to the undoubted advisability of utilizing the 3' 0" gage for the track. It was argued that from the nature of the traffic, the scant likelihood of interchange of equipment with railroads of wider gage, the relatively small amount of capital to be invested to accomplish the purpose of serving a territory fraught with unparalleled physical obstacles, and the practicability of later substituting for the pioneer construction more permanent and standard types as the country developed and revenues increased, the logical course to pursue was the adoption of the narrow gage. The great courage of the promoters is evidenced by the launching at the time of so pretentious a project to be financed with private capital, for the Denver and Rio Grande asked no subsidy from state or national government either in the way of lands or bonds, and has in all its history received none.

Grading was started in March, 1871, and the road was opened for business to Colorado Springs, January 1, 1872; to Pueblo, June 15th; and to Labran (Florence), November 1st, the same year. The first switch engine was a mule, and the first time card appeared in the handwriting of the superintendent on a piece of letter paper.

The financial panic of 1873 compelled the temporary suspension of construction work, and aside from pushing westward from Florence to Canon City in 1874, no operated mileage was added until 1876 when the road reached successively Cuchara, February 1st; La Veta, July 4th; and El Moro, October 1st. The last named station was an important one, for up to this time there were no rails in the southern part of the state. The Kansas Pacific had built in 1872 a branch from Kit Carson to Las Animas on the Arkansas where the very substantial trade in hides, wool, and other animal products originating in Southern Colorado and New Mexico were transferred from overland to rail transportation. The Santa Fé had at this time only reached as far westward as Granada, a point on the Arkansas River, fifty miles east of Las Animas. By July 1, 1877, the famous Veta Pass line over the Sangre de Cristo Range was completed to Garland, and a year later, July 10, 1878, to Alamosa.

ROYAL GORGE WAR

It is here proper to diverge and briefly recount the salient facts of what has come to be a famous event in the history of the West—viz., the Royal Gorge war. By 1877 the Leadville district as a mineral region had become so promising that decision was made by the directors of the Denver and Rio Grande to immediately extend the line westward from Canon City to the mining camp of Oro, as Leadville was then called. Simultaneously a similar decision was reached to continue construction from El Moro over Raton mountains in a southwesterly direction to reach the Rio Grande. Construction forces were started at work on the located line near Raton Pass, and preparations were made for also forging ahead from Canon City. In the Raton country Denver and Rio Grande intentions had been anticipated by the Atchison, Topeka and Santa Fé Company, and when the forces of the former had reached the site of the work they found the immediate vicinity in possession of employes of the latter. Through mutual understanding, however, after conference with the directors of the Santa Fé Company who claimed it imperatively necessary for them to have an outlet from the terminus of their line then at Trinidad to the southwest and who gave the assurance that such outlet would be immediately constructed, Denver and Rio Grande forces were removed and all available men concentrated on the construction west from Canon City. On the same day that the grading forces of the Rio Grande started work in the Grand Cañon of the Arkansas, a local company organized under the name of "Canon City and San Juan" but really a subsidiary of the Atchison, Topeka and Santa Fé Company, also began construction at the same point. This precipitated a man to man conflict, fortunately without casualties, and resulted in the ejection of the Denver and Rio Grande forces from the Cañon.

Suit was immediately filed by the Denver Company for possession of the right of way through the Gorge, which suit was really predicated upon the question as to whether the Denver and Rio Grande had not the more valid claim under the Special Act of Congress of 1872, confirming and granting to it a right of way, than a local corporation acquiring

a right of way under the General Congressional Act of 1875 for construction of a line only twenty miles in length.

About three weeks after the attempt to begin work, or to be exact on May 8, 1878, the United States Circuit Court issued an order forbidding either company to work in the canon pending final decision in the case. On June 1st, Federal Judges Dillon and Hallett rendered an opinion which permitted the Canon City and San Juan Company to proceed with its grading in the cañon, but was enjoined from laying track thereon pending further consideration of the case in the U. S. Circuit Court which was to convene the month following. On August 23rd the decision of the United States Circuit Court for Colorado handed down an opinion to the effect that prior right was vested in the Canon City and San Juan Railroad Company, shortly afterward consolidated with the Atchison, Topeka and Santa Fé Company, and the contested right of way was immediately delivered over to the custody of that company.

An appeal was taken by the Denver and Rio Grande to the United States Supreme Court, and for a period of about two years while decision was pending, the physical property of the Denver and Rio Grande Company was alternately in possession of its rightful owners and the Santa Fé Company. The United States Supreme Court on April 21, 1879, handed down its decision reversing the decision of the lower court and confirming the rights claimed by Denver and Rio Grande under the act of 1872.

But in the meantime a lease of the physical properties of the Rio Grande to the Santa Fé had been consummated, and pending cancellation of such lease, the Denver and Rio Grande could make no move towards availing itself of the gorge for construction purposes although it had proceeded with grading in the cañon above the twenty mile limit claimed by the Canon City and San Juan Company. Alleging various violations of the terms of the lease, the Rio Grande had appealed to the courts for its cancellation, and for almost a year after the decision of the United States Supreme Court the affairs of the two companies were continually in the courts with charges and counter-charges, and operations were conducted by receivers appointed thereby. Threats of violence were prevalent, armed forces



(Courtesy of the Denver & Rio Grande Western Railroad)

THE ROYAL GORGE

of both companies were in evidence, and public sentiment was at fever heat in favor of the Rio Grande in its effort to regain its property from control of the Santa Fé. Such was the state of affairs when a settlement was reached out of court in February, 1880, whereupon the property was finally and permanently restored to its rightful owners.

In making such settlement a compromise agreement was mutually executed, which provided among other things that the Santa Fé Company was to refrain for a period of ten years from building any lines except one to the coal mines near Canon City, into Colorado west of the north and south line of the Denver & Rio Grande, or into New Mexico north of the thirty-sixth parallel and west of the Spanish Range, and the Denver & Rio Grande was to refrain for a like period from building to Trinidad or easterly from the same north and south line, or into New Mexico east of the Spanish Range, or south of the thirty-sixth parallel in the western part of the Territory of New Mexico.

A financial settlement was made in accordance with the court decision, through which the Denver & Rio Grande became the possessor of the roadbed through the cañon, including the famous hanging bridge which had been during the period of litigation constructed by the Santa Fé Company. Freed from the strife and litigation which had so seriously hampered its progress, Denver & Rio Grande immediately started on an unparalleled campaign of extension and expansion.

During the period of inactivity in the actual work of construction many surveys were made along various routes through the mountains, as far north as Kokomo, west of the San Luis Valley as far as Cunningham and Weminuche Passes, and from Alamosa south along the Rio Grande del Norte as far as Albuquerque and Bowling Green. In the early '80s while actual construction work was at its height numerous surveys were made which, with those previously completed, resulted in a network of located lines occupying almost every practicable cañon and pass in the mountains south and west of Denver. Records and data of these extensive surveys covering thousands of miles of lines run have always served as a sort of encyclopedia of topograph-

ical information of the Colorado Rockies. It is estimated that there were no less than 500 surveyors in the field at the time investigations were at their height.

EXTENSIVE CONSTRUCTION

In 1880, 347 miles of road were added to Denver & Rio Grande mileage; in 1881, 381 miles; in 1882, 217 miles. By the end of 1880 the following points had been reached:

Manitou, Espanola (New Mexico), Chama (New Mexico), Leadville, Robinson, Cranes Park near Tennessee Pass, and Poncha; by the close of 1881 the various prongs of the system were tipped by Silver Cliff, Calumet, Red Cliff, Wheeler, South Fork, Durango, Rockwood, Gunnison, Maysville, Orient, and Crested Butte; and by the end of 1882, Silverton, Rock Creek, Dillon, and Colorado-Utah border were attained.

It was for the Silverton extension that the first steel rails were rolled by the Colorado Coal and Iron Company (now the Colorado Fuel and Iron Company) at South Pueblo (Bessemer). This initial rolling occurred April 28-29, 1882, and consisted of fifty-eight tons of thirty-pound rails. The price charged the Denver & Rio Grande was \$70 per ton.

On April 8, 1883, the Denver & Rio Grande Western Company of Utah completed its main line from Ogden, Utah, to the Colorado-Utah border, and thereafter the two main lines were operated by the Denver & Rio Grande Company as a through route, Denver to Ogden, 772 miles in length. It is to be observed that the Colorado portion of this main line was the Marshall Pass route, the Tennessee Pass route having its western terminus at Rock Creek, on the Eagle River. It is also interesting to note that it follows the Upper Black Cañon of the Gunnison, as had been suggested by Captain Gunnison, but avoided the Lower Black Cañon through which a preliminary line was surveyed by Mr. W. H. Bryant and party in the winter of 1882-1883.

The narrow gage through line was a most unique departure up to that time in railroad travel. It was thoroughly equipped with the best and most elegant passenger train cars, including both standard and tourist Pullman

cars, and became famous throughout the world as the "Baby Road of America."

In 1881 the Denver & Rio Grande put into effect on a larger scale than ever theretofore attempted one of a series of those very decided departures from customary railway practice for which it has become noted among the rail transportation lines of the country in the installation of a third rail on the outside of its narrow gage track between Denver and Pueblo, thereby forming a railway route which accommodated both standard and narrow gage equipment. Resort was had to this expedient by reason of the growth of the Colorado Coal and Iron Company's manufacture of steel and iron products at South Pueblo, and the advisability of the direct movement of the Atchison, Topeka & Santa Fé Company's standard gage equipment through Pueblo to Denver. The Colorado Central had a few years previously installed a third running rail in its track between Denver and Golden. This year marks the date of the first acquisition of standard gage rolling stock by the Rio Grande.

EARLY RAILROADS

The advent of rail transportation to Denver in 1870 made it possible to bring in the necessary metal consist of track from the East, and hence one of the great difficulties standing in the way of railroad construction in the mountains was removed. As a result thereof many railroad schemes were proposed, several projects actually begun, and a considerable railroad mileage was constructed in the 1870-1880 decade. Up to 1885 there were no less than 204 distinct articles of incorporation filed with the territorial and state secretaries. Many of these never materialized further than the paper stage, and but few were carried to completion in their entirety.

The Colorado Central Company completed a narrow gage line from Golden to Black Hawk in 1872, extended it to Central City in 1878, and reached Georgetown with the track in 1877. The line from Georgetown to Silver Plume via the famous Georgetown Loop was completed by the Georgetown, Breckenridge & Leadville Company in 1884.

A standard gage line from Golden to Longmont was completed by the Colorado Central Company in 1873. This line was, with the aid of the Union Pacific, extended to Cheyenne in 1877, thus forming two routes between Denver and Cheyenne—one the Denver Pacific direct via Greeley, and the other via Colorado Central and Golden, some twenty-four miles longer.

As has been previously mentioned, the Kansas Pacific built a branch in 1872 from Kit Carson to Las Animas, on the Arkansas River, but after the Santa Fé extended its line into Pueblo, this branch was removed in 1877 primarily to obtain track material for railroad construction in Kansas.

DENVER, SOUTH PARK & PACIFIC

The Denver, Georgetown & Utah Railway Company was incorporated by Governor Evans and associates as a narrow gage line, March 9, 1872, to construct a railroad from Denver to Morrison, thence to Georgetown, Berthoud Pass, and Colorado River to Utah, with a branch through South Park to Buena Vista and the coal fields of Gunnison County. That portion of the line between Denver and Morrison was constructed in 1874, and when it became evident that the Colorado Central was building to Georgetown, the Denver, Georgetown & Utah Railway Company was reorganized as the Denver, South Park & Pacific Railway Company on September 30, 1872, and immediately announced its withdrawal from the projected Georgetown and Utah extension. Work on the extension into South Park through Platte Cañon was resumed in 1877, and rails were laid as far as Baileys in 1878. Thereafter the Denver, South Park & Pacific obtained a substantial proportion of the Leadville business freighted to and from that point which had previously been routed via Ute Pass to Colorado Springs and to Canon City. When it had reached Nathrop in 1880 on its extension into the Gunnison country, and upon termination of the Royal Gorge war and the advent of the Denver & Rio Grande into Leadville, the South Park, under an agreement, operated over Denver & Rio Grande track from Nathrop to Leadville. Immediately after the

acquisition of the South Park line by the Union Pacific and the termination of the Buena Vista-Leadville joint trackage contract with the Denver & Rio Grande, the South Park built from Como via Boreas Pass, Breckenridge, Ten Mile Creek, and Frémont Pass to Leadville, completing that line in 1884, about four years after the Rio Grande track had reached that point.

While this construction was in progress the Rio Grande also was building northward over Frémont Pass from Leadville with a view of reaching the Grand River via Ten Mile Creek and the Blue River. Its line was completed over the pass and as far as Robinson by the end of 1880, and to Dillon in November, 1882. For some time it had been apparent to the Rio Grande that the South Park constituted its most formidable rival, and that many objectives were common to plans of both companies. This resulted in keen competition in rapidity of building new lines, not that there would be eventually insufficient business for both, but because of the advantage to be gained in favorable entrenchment with respect to the mines and occupation of easily negotiated passes, cañons, and defiles. The Gunnison country and the Crested Butte coal fields were typical of the situation in this respect.

The Rio Grande started building to Gunnison from South Arkansas (Salida) via Marshall Pass at about the same time the South Park started construction westward over the College Range from Nathrop via Chalk Creek and Alpine Pass, the former reaching Gunnison with its rails, August 6, 1881, months in advance of the latter. On October 1, 1881, the Rio Grande was prepared to transport coal out of Crested Butte, but the South Park did not reach the Baldwin coal mines until 1883.

Under the name of the Pueblo & Arkansas Valley, incorporated March 24, 1875, the Atchison, Topeka & Santa Fé extended its line westward from Granada to Pueblo, reaching that point March 1, 1876, and afterward in 1880 built westward from Pueblo up the Arkansas River to the Rockvale coal fields. It was not until 1878 that the Santa Fé built from La Junta to Trinidad.

The Chicago, Burlington & Quincy, by virtue of the incorporation of the Burlington & Colorado Railroad Com-

pany, extended its line of road from the east into Denver, and was ready for operation of the through line, Denver to Chicago, July 2, 1882.

Among the early local railroads which later grew to important positions in the transportation facilities of the state was the Denver & New Orleans Railroad Company, incorporated by Governor Evans and associates on January 25, 1881. The project was a part of a pretentious plan to have divergent lines of railroad extending from Denver—one to Duluth, the other to Puget Sound, and a similar bifurcation in Texas, one branch extending to Galveston and another to New Orleans. The lines northeast and northwest from Denver have never materialized, and the lines south have been only partially constructed. The Denver & New Orleans was placed in operation, Denver to Pueblo, 124 miles, May 3, 1882, with the Franceville branch, four miles long, put in operation May 3, 1882, and a second branch from Manitou Junction to Colorado Springs, nine miles long, on January 1, 1883. It is interesting to note in passing that the main line of the Denver & New Orleans between Denver and Pueblo follows almost exactly the Overland Trail from the Arkansas to the Northwest. Denver and Pueblo were now connected by two separate lines of railroad—one the Denver & Rio Grande, accommodating both narrow and standard gage traffic, the other the Denver & New Orleans, exclusively a standard gage line. Another line which later became important was the Julesburg Cutoff, built in 1882 from Julesburg to LaSalle by the Colorado Central Company.

Several other local railroads of lesser importance were constructed in the decade and a half ending with 1885, so that by the end of that period there were within the state fourteen operating railway companies with a total mileage of 2,910 miles of main line and branches. This mileage was divided into 1,575 miles of narrow gage road, 1,196 miles of standard gage, and 139 miles of three-rail road.

OVERLAND MOUNTAIN TRANSPORTATION

It is proper here to revert to transportation by animal power, for by this time packing transportation was begin-

ning to wane and freighting had about reached the maximum. Rails had stretched from the open places to many of the mining camps and roads had largely replaced pack trails. Only in the precipitous mountain regions were pack animals used extensively. In the '70s long distance freighting was at its height. Toll roads were still much in evidence, for the discovery of new mineralized districts demanded long wagon hauls to remote places. Counties were not sufficiently organized nor wealthy enough to supply funds for road building, and neither territory nor state could make appropriations therefor. Calls came from every nook and corner of the mountains. Railroads could not be financed, and any kind of a wagon road must be used.

Owing to lack of complete references and the obscurity of such as are available, it is impossible to define any but the most important and more permanent routes. A road constructed in 1870 ran from Boulder via Nederland to Caribou, and another, constructed later, from Central City and Black Hawk to the same point. A road also led from Loveland to Estes Park. Georgetown was the rail head for wagon routes via Empire and Berthoud Pass to Hot Sulphur Springs, and via Argentine Pass and Montezuma to the Ten Mile district and the Blue River. The most extensively traveled route from Denver to Leadville was via Platte Cañon, Jefferson, Fairplay, and Weston Pass. As the Denver, South Park & Pacific Railroad extended its line into South Park along this route, wagon and stage hauls were shortened and other roads were constructed, as, for example, one from Fairplay over Mosquito Pass, shortening the distance to Leadville by twenty miles, and another from Jefferson via Georgia Pass to Breckenridge on the Blue.

Howbert is authority for the statement that probably the first bond issue for a county road in Colorado was voted in an election June 20, 1871, for the construction of a road from Colorado Springs through Ute Pass, a route which had previously been used to gain access to South Park from Pueblo and points east on the Arkansas. This road joined others in South Park to form a second primary route to Leadville.

The next road of importance was from Canon City to Leadville, which at first, as has been mentioned, ran via

Currant Creek into South Park and thence out of the park to the Arkansas River and on to Leadville. Later it followed generally the Arkansas River except at the Royal Gorge and a few other places where it detoured around the narrow cañon reaches of the river. Thus Leadville and its environs, including the mountains forming the Mosquito Range and the west margin of South Park, were served with three principal routes, one from Denver, another from Colorado Springs, and the third from Canon City. In his *Olden Times in Colorado*, C. C. Davis states that in 1879 there were engaged in wagon transportation on these three principal routes from 5,000 to 7,000 men, while Irving Howbert in his *Memories of a Lifetime in the Pike's Peak Region* says there were 12,000 horses and mules at one time on the Ute Pass route alone.

The vast expanse of mountains south and west of the Arkansas came in for its share of attention. Into the heart of this region there came up the Rio Grande del Norte from the south in 1867 Otto Mears, who, because of his ceaseless and energetic activity in opening all sorts of lines of communication and travel in the southwestern part of the state, later won his distinctive appellation, "The Pathfinder of the San Juan." His entry into the transportation industry consisted of packing, later changed to freighting, between Denver and Saguache via Pueblo and Veta (Sangre de Cristo) Pass. The route was shortened as extension of the Rio Grande proceeded southward, and finally in 1873 Mr. Mears transferred his stock and equipment to other more profitable routes of his own. His road over Poncha Pass was built in 1867, and formed a route from Saguache to Nathrop, where connection was made with the Denver-California Gulch road through South Park. This construction was the beginning of the Mears system of toll roads, finally aggregating some 300 or 400 miles. In 1871 Mr. Mears built a wagon road from Saguache to Lake City via Cochetopa Pass and Lake Fork. Next the Lake Fork and Ouray toll road was built from a point on the Saguache-Lake City road near the mouth of Indian Creek via the Uncompahgre Agency and Uncompahgre Valley to Ouray. This was followed by the Poncha Pass, Marshall and Gun-



THE OURAY-RED MOUNTAIN ROAD OF TODAY

nison toll road constructed in 1880 from a point on the Saguache-Nathrop road via Marshall Pass to Gunnison.

Probably the most noted and spectacular accomplishment of Mr. Mears in the way of road building consisted of his construction in 1882 and 1883 of the famous Ouray-Silverton road over Red Mountain. For many years this was the trail of the memorable Circle Route Stage, and with the setting of its novel snow tunnel in the midst of mountains of surpassing beauty has never been excelled as a scenic mountain road. The Mears toll road from Dallas to Telluride was constructed in 1882.

In addition to the Mears roads in the Southwest there was a notable road even as far back as the early '70s running from Del Norte through Antelope Park, over the Continental Divide at Slumgullion Summit, and down to Lake City. Later, in 1879, a branch from this road was constructed from a point in Antelope Park to Silverton via Stony Pass and Cunningham Gulch, following for the greater part of its length the erstwhile pack trail between Del Norte and the Animas mining district. Access to Aspen and Ashcroft was afforded in 1880 by a poor road from Granite via Twin Lakes, Independence Pass, and the upper reaches of the Roaring Fork.

It is to be observed that railway, wagon, and pack animal transportation was contemporaneous for a considerable period of time—rail transportation to rail head, wagons as much farther as practicable, and then pack animals to points inaccessible to either of the other forms. The length of haul of each changed rapidly, especially in the case of wagon haul, and pack animal haul usually constituted only a small proportion of the total. But in the early years of the period of which we are speaking some exceptionally long pack train hauls were accomplished. For example, in 1874 the machinery for the Greene Smelter at Silverton was packed on burros from Pueblo via Veta (Sangre de Cristo) Pass, Fort Garland, Del Norte, Antelope Park, Stony Pass, and Cunningham Gulch to Silverton—a distance of about 250 miles.

Stages for passengers and mail were numerous and various in kind. Mules gradually replaced the slow-moving

oxen of the plains. Prairie schooners were discarded for ore wagons sturdily built to withstand under heavy load the shock of rough and rocky roads. Burros and mules replaced most of the horses hitherto used for packing. Staging, packing, and freighting were developed to the highest degree of efficiency. Men engaged became experts in the art of handling animals. The whole industry of overland transportation in the mountains was a business for men of ability, and soon became an absorbing vocation for those employed in it. Freighting and packing concerns were organized for profit, and competition was rife. Rates were less important than expeditious service. Delivery of the biggest load and return for another in the shortest possible time was the criterion for a good "skinner." The teamster shoveled the ore into his wagons at the mine, shoveled it out into railroad cars or into ore bins at the end of his trip, where he was obliged to stow his wagons with return freight, feed, and rest his animals, and "hit the trail." Some trips were long, requiring days for their completion. Night stations for men and animals were established where needed. Means of repairs to wagons and harness and blacksmiths for shoeing animals were provided along the route and at terminals. Since the heavy load was usually downhill, two wagons called "wagon" and "trailer" were chained together tandem with only enough space between them to permit negotiation of sharp turns in the road. Usually the team consisted of three spans of mules. The teamster or "skinner" always rode the left wheel mule and drove with a jerk line running to the bridle of the left leader, the inside of this animal's bridle being connected with his mate's by a light wooden rod. Animals were trained to respond to either a series of jerks or steady pull on the jerk line for guidance to the right or left. Because of the narrow and tortuous alignment and the heavy grades of the roads, great skill was required of the drivers. Often the turns were so sharp and the road so narrow, with a precipice on one side and a cliff on the other, that with a six-mule team safe passage thereover could be negotiated only by getting up speed on the approach to the turns, holding back the leaders with the jerk line of a freighter, or

with the reins if a stage—thus bunching the animals and allowing the momentum of the vehicle to carry it around the curves. Brakes were of the utmost importance, and each wagon was equipped with large wooden blocks for brake shoes and a wooden pole extension to the lever arm for greater leverage. A rope running from the top of the pole to the teamster's saddle was used to operate the brake. On narrow roads with blind turns and few passing places, a cow or sheep bell was attached to one of the leaders to serve as an approach warning of the team.

Stowing of some kinds of load such as merchandise, and the lashing of others such as pipe and machinery, required skill and judgment to guard against shifting and damage in the travel over uneven or deeply rutted roads. In packing the greatest dexterity was required. All kinds, shapes, and sizes of articles were transported, including long timbers, pieces of machinery, cases of merchandise, blasting powder, iron bars, and building materials. Long pieces to be transported were fastened at one end to the pack saddle, allowing the other end to trail on the ground behind the animal. Commercial packing was performed in trains of mules or burros in single file. Mules were generally attached together tandem throughout the full length of the train to insure proper formation for the trail and were led by the driver. Burros were herded loose by the driver, who always rode a horse or mule and herded the train from the rear.

Packing rates varied of course with length of haul, and were usually two or three times as much as wagon rates. The packing charge was approximately \$2.50 per cwt. for ten miles, or an equivalent of \$5 per ton mile. The pack trail ore rate, Aspen to Granite, was \$50 to \$100 per ton, and the packing rate from Camp Bird Mine, near Ouray, to Silverton, \$35 per ton. The through rate for a combination of wagon and pack haul, Silverton to La Veta, was \$60, to Fort Garland \$50, and to Alamosa \$40 per ton. The all-wagon haul charge, Saguache to Denver, in 1870 was \$60 per ton, and from Silverton to Del Norte in 1879, \$30 per ton for distances of 280 miles and 80 miles, respectively. The load for a burro was 200 pounds, and for a mule 300

pounds. Ore wagons and trailers were built with high sides to carry four or five tons each.

Because of longer distances, greater cost of construction, and perhaps a better character of roads, the charges for passing over toll roads were higher in the later years of the toll roads period. Tolls varied from \$2 to \$5 for a vehicle drawn by a one-span team, with generally \$2 extra for each additional span attached. Probably the highest toll was that prevailing between Ouray and Silverton, a distance of twenty-four miles, where a charge of \$5 for a single span team was made.

There were numerous small owners of stage, freight, and packing lines throughout the mountain region, but the great preponderance of traffic was handled by a few large outfits. The W. & L. Smith stage line served Caribou and Nederland from Boulder and from Central City and Black Hawk. The operation of the extensive Denver and South Park stage line was carried on by Spottswood & McLellan, who also operated from Colorado Springs via Ute Pass into South Park and to Leadville. Rosita and Silver Cliff were served by Magrue & Smith's line plying from Canon City to those points. Practically all other stage lines in connection with the Denver & Rio Grande were operated by Barlow & Sanderson. Among the extensive freighters were True & Sutton, operating from Colorado Springs to South Park and Leadville; Otto Mears, with packing as well as freight outfit from Denver, Colorado Springs, and Pueblo to Saguache, and later from successive rail heads of the Denver & Rio Grande to and between almost all points in the San Juan country; David Wood, from Montrose to and between camps in the Ouray and Red Mountain districts; and John Ashenfalter, from Montrose and other points as railroad construction proceeded to Red Mountain, Ouray, Ophir, and Telluride and their environs.

COLORADO MIDLAND

A distinct and most important period of railroad construction set in with the beginning of the year 1886 and lasted for six or seven years. The lure of the Ute Pass doorway into South Park and the mountain districts along

the great range finally after many years exacted its toll. Previously all rail lines in the high and rugged areas were narrow gage, the construction of which was more consistent in attaining the desired objectives with the funds then available. But narrow gage routes seemed long and roundabout, and it was just a step from Colorado Springs over the mountains to Leadville and the western slope. Moreover, how could a narrow gage line ever hope to become a link in a transcontinental system? Small wonder then that with so attractive an avenue the Colorado Midland was launched as a standard gage railroad. The company was organized for action in 1885. The cost of construction was naturally excessive, and considerably more than was anticipated. Physical features of the line such as rise and fall, gradients and curvature, were severe, so severe in fact as to react disastrously on the revenue. The heavy investment and the difficulty of operation more than offset the advantage of minimum distance. But for thirty years the Colorado Midland was a factor in Colorado rail transportation. It was constructed from Colorado Springs via Manitou, Ute Pass, South Park, Buena Vista, and the Arkansas River to Leadville over much the same route as was taken by some of the early prospectors who came up the Arkansas River from the east bound for California Gulch. From Leadville the line extended directly across Sawatch Range to the headwaters of the Frying Pan, crossing the Continental Divide at Hagerman Pass by means of a 2,064-foot tunnel with an elevation of 11,528 feet. Following the Frying Pan to its confluence with the Roaring Fork the line there branched, one prong extending up the Roaring Fork to Aspen, the other following downward along that stream to Glenwood Springs, and then along the Grand (Colorado) River to Newcastle. The Midland reached Leadville in 1886, Aspen late in 1887, Glenwood Springs in 1888, and Newcastle in 1889. At Newcastle it united with the Denver & Rio Grande in a joint line thence to Grand Junction.

On August 1, 1890, the famous Busk-Ivanhoe tunnel under Hagerman Pass was started. This tunnel was completed after about three years' work with a dreadful toll of life. It is 9,394 feet in length, and eliminated for the

Midland seven miles of distance and 530 feet of elevation. It is now used as a part of a state highway, the Colorado Midland track west of Divide having been abandoned and taken up in 1921.

PLAINS RAILROADS

The Missouri Pacific under the corporate name of the Pueblo & State Line Railroad Company was completed to Pueblo in 1887, thus affording that city a second direct rail route to the Missouri River. The same year the Santa Fé built its lines from Pueblo to Denver and from Florence to Canon City under the corporate names of the Denver & Santa Fé, and Pueblo & Arkansas Valley companies, respectively. There were now three lines of railway between Denver and Pueblo, and two between Pueblo and Canon City.

In 1888 the Rock Island, under the corporate name of the Chicago, Rock Island & Colorado Railway Company, completed its line of road from the Colorado-Kansas border to Colorado Springs, crossing the Union Pacific (Kansas Pacific) at Limon. It reached Pueblo and Denver via Rio Grande rails, and later, in the following year, through an operating agreement moved its trains over Union Pacific track from Limon into Denver. The Rock Island was the last of the Trans-Missouri railway systems to arrive on the scene. The Union Pacific from both Kansas City and Council Bluffs, the Santa Fé, the Burlington, the Missouri Pacific, and the Rock Island now had termini in Colorado on the eastern slope of the mountains. The Burlington added 140 miles to its Colorado mileage in 1887 by constructing its Cheyenne line via Sterling from the Colorado-Kansas border to the Colorado-Wyoming border, and thirty-two miles in 1889 by construction of the Lyons branch.

While the line of the Denver, Texas & Fort Worth Railroad Company was being constructed to connect Colorado with Texas, the track of the Denver & Rio Grande Company between Pueblo and Trinidad was used by the Fort Worth Company to effect continuous service between Denver and Trinidad in connection with the Denver, Texas & Gulf Railroad Company, which had acquired the property

of the Denver & New Orleans Railroad Company north of Pueblo. The Fort Worth Company completed its line of road from Trinidad to the Colorado-New Mexico border in 1888, and for years thereafter continued to use Denver & Rio Grande track between Trinidad and Pueblo. By 1888, therefore, not only were there five lines connecting Colorado with Eastern states, but also one line leading from Colorado south into Texas.

MOUNTAIN RAILROADS

One of the most spectacular railroad undertakings in the state was launched in 1885 by the incorporation of the Manitou & Pike's Peak Railway, with Maj. John Hulbert of Manitou as its first president. It was not, however, constructed until 1889, and not until the following year, 1890, was it placed in service. The line is nine miles in length, and extends from Manitou to the top of Pike's Peak. The Abt Rack System is used for negotiating the climb, which requires as high as 25 per cent gradients to accomplish the ascent in the nine miles of distance. The Pike's Peak Railway has always been popular, and still continues to attract travelers.

Another unique railroad was to be found in the Gilpin County Tramway, built in 1886 and 1887 to serve the mines in the Central City and Black Hawk district. The gage of its track was twenty-four inches, and its particular function was the hauling of ore from the various mines in the district to the nearby mills and Colorado Central Railroad cars at Black Hawk and Central City. The line was about twenty-four miles in length, and extended between Central City, Russell Gulch, Black Hawk, Quartz Hill, and Nevadaville. It finally came into the possession of the Colorado & Southern Railway along with other Colorado & Central properties, and was abandoned and entirely removed in 1917.

Meanwhile the prongs of the Rio Grande were growing, some extending, others expanding into standard gage and double track, and still others starting new. With the Colorado Midland at Leadville and headed across the high mountains for Aspen, the Rio Grande hurried around down

the Eagle and Colorado rivers to Glenwood Springs and up the Roaring Fork to Aspen, reaching that point with narrow gage track in 1887, a few days in advance of its big rival. Construction through the picturesque cañon of the Colorado near Glenwood Springs was slow and difficult in the extreme, yet time was taken to build a standard gage roadbed, for it was then known that soon a standard gage track would be required. On the opposite side of the cañon lay the partially formed roadbed of the Colorado Railroad, a Burlington corporation. This work had been done shortly before the coming of the Rio Grande, when some two or three years after reaching Denver in 1882, the Burlington had extended its surveys over the range near James Peak and down the Colorado River to and beyond Glenwood Springs.

In the same year, 1887, the call of Ouray was answered and a Rio Grande prong starting at Montrose grew along the Uncompahgre Valley until it reached the "Gem of the Rockies," as Ouray is often called. Trinidad, too, was attained by a short stretch of four miles of track branching from El Moro. In addition the line south of Pueblo had to be made ready for the standard gage Denver, Texas & Fort Worth, which was rapidly approaching from Texas and clamoring for trackage rights over Rio Grande rails to Pueblo. This appeal was fully answered the following year, as was also that of the Rock Island, to obtain a way to Denver and to Pueblo from Colorado Springs, where it had paused after its long trek across the plains. Probably the first double track in the West, certainly the first in Colorado, was put in service by the Rio Grande in 1888, when three short stretches of second main track aggregating twenty-seven miles, were constructed between Denver and Pueblo. The development of the Southern Colorado coal fields was setting in, and branches to coal mines were built by both the Fort Worth and Rio Grande companies. Similarly, the great pine forests of Archuleta County, Colorado, and Northern New Mexico were called to deliver their treasure to the needs of the growing and developing commonwealth, and rail spurs were constructed into their depths.

In 1889 a branch was built from Petersburg across the



(Courtesy of the Denver & Rio Grande Western Railroad)

MARSHALL PASS, "THE GREAT CONTINENTAL DIVIDE"

Altitude, 10,856 feet above sea-level. Mount Ouray in the distance—altitude, 13,956 feet

valley of the South Platte to Fort Logan, and thereafter suburban rail service, the first and only of its kind in Colorado, was inaugurated between Denver, Littleton and Fort Logan by means of the historic "Uncle Sam" train.

The same year a branch was constructed to the undeveloped Aberdeen granite quarry, tucked away off in the hills in the extreme southern part of Gunnison County. The sole purpose of opening the quarry was to obtain granite for the State Capitol at Denver, then under construction, and when the building was completed the quarry was closed and has never since been opened. Thus the source of the beautiful granite of which the capitol is constructed is concealed, as it were, from the general public. A few years ago the track was removed, and little evidence of the existence of the Aberdeen branch remains.

Because of its geographical position in the midst of surrounding mountains, Lake City had to be served exclusively by a branch thirty-six miles in length, on which construction had been started in 1882, but which remained uncompleted until 1889. Although standard gaging was imminent, yet the appearance of the Colorado Midland in the immediate vicinity with its threat of building on westward through the Uintah Basin to Salt Lake City forced a hurried extension of the narrow gage line from Glenwood Springs down the Colorado River to Rifle, a distance of twenty-seven miles.

Down in the very heart of the San Juan country Otto Mears completed the "Rainbow Route" from Silverton over Sheridan Pass to Red Mountain and Ironton in 1889 under the corporate name of the Silverton Railroad Company. Perhaps there still live some of those favored few who were honored by Mr. Mears with an annual pass consisting of an engraved silver plate set in a frame of silver filigree, the outside dimensions of which corresponded to those of the customary card pass.

By this time, 1889, it became apparent that if the Rio Grande were ever to occupy an important place among the rail transportation lines of the West it must move quickly and decisively in standard gaging its lines. To settle for all time the economic question of constructing a new line

west over the mountains from Denver, the most extensive surveys hitherto attempted were undertaken. The main range from Berthoud Pass on the north to Tennessee Pass on the south was exhaustively studied. Several routes were located, each making use of one of the several famous passes in the vicinity—viz., Argentine, Grizzly, Montezuma, Georgia, and Alicante. All these were considered separately, their advantages and disadvantages weighed carefully, and all rejected as economically impracticable in comparison with the standard gaging of the Royal Gorge route. While the surveys cost an enormous sum, actually \$106,374.15, yet the expenditures have proven justifiable in answering the oft-repeated question as to whether or not there did not exist at least one attractive gateway through the mountains directly west from Denver. As a matter of fact, there is no direct approach from the east to the summit of the main range within the borders of Colorado more favorable than that afforded by the Arkansas River.

The year 1890 was one of the most important in the history of the Rio Grande. The Colorado Midland, having reached Newcastle late in the preceding year, an agreement was consummated between that company and the Denver & Rio Grande for a common outlet westward to Grand Junction, there to connect with the Rio Grande Western. Joint trackage rights were granted the Midland over Rio Grande rails to Rifle Creek, and the Rio Grande Junction Railway Company was jointly formed to construct a standard gage line, Rifle Creek to Grand Junction, which, upon completion, was leased to the two proprietary companies. The end of the three-rail track which had rested at Canon City was carried forward on improved gradients and alignment to Malta. From Malta west practically a new line, involving a tunnel about one-half mile in length at Tennessee Pass, was constructed to Red Cliffe, and the track west of Red Cliffe, then narrow gage, was converted into standard gage to connect with the standard gage line of the Rio Grande Junction at Rifle Creek. The standard gaging of the Rio Grande Western having been completed eastward from Ogden to Grand Junction on June 10th, and the standard gaging of the Denver & Rio Grande into

Grand Junction on November 14, 1890, a through standard gage line, Denver to Ogden, 778 miles in length, resulted. Thus the Royal Gorge, which had ten years previously been the object of such bitter strife, now served the highest purpose for which it could be used. The same year, by means of a stretch of track nearly fifty-four miles long without curve, Villa Grove was connected with Alamosa, an anomaly that could scarcely occur any place in Colorado except in the San Luis Valley. Through trains between Silverton and Denver were thereafter routed via Villa Grove, Poncha Pass, and Salida, rendering all the more intensive the use of the Royal Gorge gateway, and utilizing the novel expedient of moving narrow gage trains with standard gage locomotives between Salida and Denver.

An additional significance in the history of Colorado rail transportation is attached to the year 1890, in that it marked the date of maximum narrow gage railroad mileage within the state. Notwithstanding the fact that there was subsequent narrow gage construction, yet the gradual standard gaging of most of the Rio Grande lines effected a net decrease in miles of narrow gage railroad.

The Rio Grande Southern was constructed in 1890 from Ridgway, on the Ouray branch of the Denver & Rio Grande, to Telluride, by utilizing for the roadbed extensive portions of the toll road over Dallas Divide which Mr. Mears had previously built in 1882. The following year the Rio Grande Southern was extended southward via Ophir, Trout Lake, Lizzard Head Pass, Rico, Dolores, and Mancos to a connection with the Denver & Rio Grande at Durango. Probably nowhere else can there be found at close hand so splendid an array of majestic mountain peaks as along the Rio Grande Southern between Telluride and Rico.

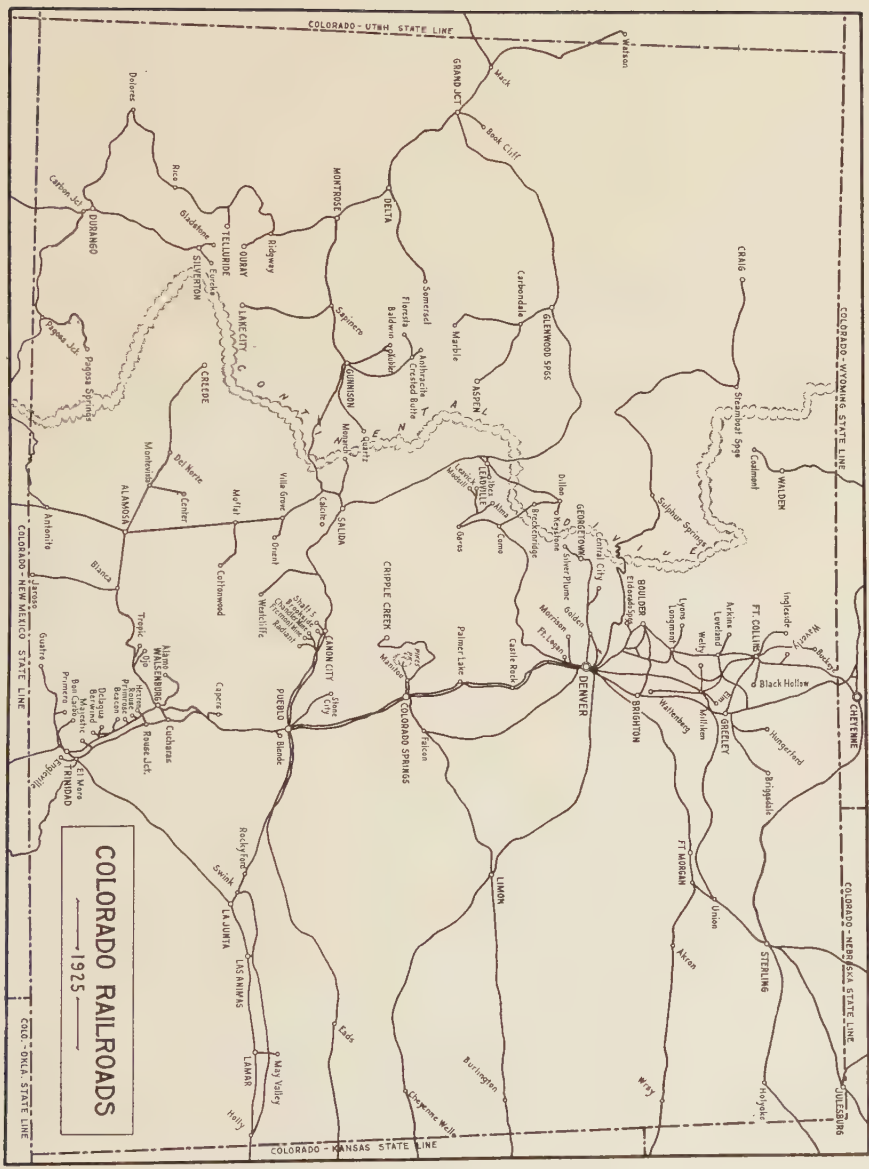
It was in 1891 that the last, save one, of the notable mining camps of the state came into prominence. When the boom struck Creede, the rail head was at Wagon Wheel Gap, only ten miles away, where it had previously remained stationary for eight years. A few weeks only were required to reach the camp that has had perhaps the most meteoric rise of all. Creede's glory was short-lived, however, for notwithstanding its maximum production was not reached until 1893, prices of silver and lead had already started on

a rapid decline, and no industry for their exclusive production could long hold out against the onslaughts of the falling market. The financial panic which had started in 1892 reached a crisis in the following year, and mining of all industries suffered most. As a consequence, railway expansion in Colorado received a check from which it did not recover for years afterward.

CHECK IN RAILROAD CONSTRUCTION

There was little growth of transportation facilities for almost a decade, and aside from isolated cases here and there throughout the state, no extensive construction was undertaken. It was a period of adjustment rather than of expansion. The Union Pacific properties in the state were insolvent. The receiver for the Union Pacific, Denver & Gulf, which had been formed by the consolidation of the Denver, Texas & Gulf, the Denver, Texas & Fort Worth, the Colorado Central, and some smaller companies, canceled the trackage contract with the Rio Grande and completed in 1895 a separate line of road from Trinidad to Walsenburg. A new contract was negotiated for trackage rights over the Rio Grande between Walsenburg and Pueblo, and this prevailed for sixteen years afterward. The Florence & Cripple Creek, a narrow gage, was completed into Cripple Creek in 1894, and the Midland Terminal, a standard gage, reached Victor in the same year, and Cripple Creek the following year from Divide, on the Colorado Midland. The Silverton Northern was constructed in 1894 from Silverton via Howardsville to Eureka by Otto Mears and associates, and extended in 1903 to Animas Forks, utilizing for the extension the wagon toll road which Mr. Mears had constructed in 1896. In 1898 the Colorado & Southern Railway Company was formed and took over from the foreclosure purchasers the properties of the Denver, Leadville & Gunnison, and the Union Pacific, Denver & Gulf, which were thereafter operated as a consolidated system. The same year, the Colorado & Northwestern (later the Denver, Boulder & Western) was completed from Boulder to Ward. The Crystal River Railroad, owned

COLORADO RAILROADS (1925)



by the Colorado Fuel and Iron Company, was put into operation from Carbondale to Placita, twenty miles, in 1899.

RAILROADS RESUME GROWTH

Cripple Creek was the last of the great mining camps of the state to attract rail transportation lines. A third line was added to its railroad facilities in 1901. The Cripple Creek District Railway, an electric line operating between Cripple Creek and Victor, was purchased in March, 1899, by a group of Colorado Springs capitalists, and was organized as the Colorado Springs & Cripple Creek District Railway Company, with Irving Howbert as president. Construction from Colorado Springs to Cripple Creek was started late in 1899, and the road put in operation in the spring of 1901.

Traffic originating in and destined to points in the San Luis Valley had by 1898 increased to such an extent as to make a standard gage line into the valley an economic necessity. Accordingly, the following year, 1899, the Rio Grande built a standard gage line between La Veta and the foot of the mountain slope in the valley which, together with the standard gaging thence to Alamosa, furnished a standard gage outlet from the commercial center of the valley to Pueblo and Denver. In this construction the Sangre de Cristo Pass of history was abandoned for the occupation of another route eight miles farther south. Pagosa Springs, the county seat of Archuleta County and center of the lumbering industry in the southwestern part of the state, was served by a line of railroad in 1900 through the construction of a narrow gage branch from the Rio Grande main line near Juanita. The Wet Mountain Valley and the old mining camps of Silvercliff and Westcliff, which had been without rail transportation facilities since the narrow gage branch constructed thereto from Canon City in 1882 had been practically destroyed by floods in 1889, were again served by transportation facilities through the construction in 1901 of a standard gage branch leaving the main line at Texas Creek.

The valley of the north fork of the Gunnison, for many

years foremost in the horticultural industry, was until 1902 without rail transportation. In that year the Rio Grande constructed the North Fork branch, a narrow gage track on standard gage roadbed, branching from the original narrow gage through line at Delta. The branch was extended somewhat beyond the head of the valley to Somerset in order to reach the western slope outcrop of the Crested Butte coal fields. Four years later this line, as well as the original narrow gage main line between Montrose and Grand Junction, comprising a total of 116.5 miles, was converted from narrow gage to standard gage in a brief space of two or three days in July, 1906, without serious delay to traffic. By 1902 so much of the Rio Grande narrow gage mileage had been changed to standard gage as to permit the lifting of the narrow gage rail from the three-rail track between Denver and Pueblo, and henceforth the small red cars with gold-leaf lettering which had been so distinctive of the mountain region were not again seen in the Denver terminals. In 1905 Farmington, New Mexico, was served by Rio Grande rails through the construction of a standard gage branch down the Animas River from Durango.

Among the other rail transportation activities carried on in the decade from 1900 to 1910, some should be specifically mentioned. In 1900 the Burlington constructed a line from the Colorado-Nebraska state line near Peetz, Colorado, to a connection with the Union Pacific at Sterling, and from Union, Colorado, to Brush, which with trackage rights over that portion of the Union Pacific's Julesburg short line between Union and Sterling gave the Burlington a direct line, Denver to Alliance, Nebraska. Down in the southern part of the state the Colorado & Wyoming, a Colorado Fuel and Iron Company corporation, in 1903 completed a line of road from Trinidad westerly along the Las Animas River to Cuatro, a distance of thirty-two miles. Over near the Colorado-Utah border the Uintah Railroad, a narrow gage line, was constructed in 1905 from Mack, Colorado, on the Denver & Rio Grande, to Dragon, Utah, just across the border, in order to reach the gilsonite industry in the Uintah Basin. In 1906 the Argentine Cen-

tral, a narrow gage line fifteen miles in length, was completed from Silver Plume to the summit of Mount McClellan, reaching an altitude of over 14,000 feet. The same year the Colorado & Northwestern extended its line of road from Ward to El Doro and Sunset. It was at the close of the decade that the Denver, Laramie & Northwestern Railroad, a project of pretentious scope, was started. The line was completed between Denver and Greeley in 1910, and after being operated a few years, was abandoned and sold for salvage value. The Great Western Railway, incorporated in 1901, had fifty-five miles of road in operation by 1910 in the beet fields north of Denver, and down in the San Luis Valley the Costilla Estates Development Company completed the San Luis Southern Railway from Blanca to Garosa, thirty-two miles, by the close of the same year.

THE MOFFAT ROAD

Notwithstanding the importance attaching to all these transportation activities, yet in the early years of the period there was started a railroad project which was destined to become of still more vital concern to the citizens of the commonwealth. The Denver, Northwestern & Pacific Railroad Company was incorporated July 18, 1902, with David Moffat as president, to build a railroad extending from Denver to Salt Lake City. Actual work of construction was started shortly after the date of incorporation through the medium of a construction company of which Sylvester T. Smith was president. As the work proceeded exhaustive surveys were made, especially of that portion of the line involved in negotiating the main range directly west of Denver at Rollins Pass. It was inconceivable that any road could successfully overcome the difficulties of operation with a summit elevation of 11,660 feet, the official altitude of the pass. On the other hand, the cost of piercing the main range with a tunnel sufficiently long to produce a summit elevation consistent with economic operation was prohibitive for an unproven undertaking. Studies of the problem lead to the location of three tunnel sites of different lengths and elevations, coördinated with consistent gradi-

ents in the lines of approach thereto. The line of road on either side of the range was so located that any one of the three tunnels, depending upon the volume of accruing traffic, might afterwards be constructed with a minimum sacrifice of work theretofore accomplished and with an additional investment coördinate to ultimate economy. This meant that all that portion of the line above the elevation of the lowest and longest tunnel was temporary, while the remainder could be constructed over gradients and alignment which would prevail permanently. The steepest gradients and sharpest curvature permissible were therefore utilized in building the portion of the line above the longest or six-mile tunnel site, but even then the line over the pass was twenty-three miles longer than it would have been via the tunnel through the mountain. Owing to the rugged nature of the country traversed, construction of the permanent portions of the road were difficult and expensive and involved the driving of numerous short tunnels. The rails reached Hot Sulphur Springs in 1905, Steamboat Springs in 1908, and the road was completed to Craig in 1913.

The decade ending with 1910 increased the total mileage within the state to 5,533 miles, there having been added during the period 884 miles, as compared with only 358 miles the preceding decade.

UNCOMMON TRANSPORTATION

Other forms of transportation had long ere this made their appearance. As early as 1893 aerial tram transportation was used to serve mines in some cases otherwise inaccessible and in others to supplant animal pack trains. Many of these trams were built in the mining districts of the state, some of the most notable being the Silver Lake tram at Silverton, $2\frac{3}{4}$ miles in length; the Sunnyside, at Eureka, nearly four miles in length, and the very recently constructed Rawley Mines tram from Bonanza to Shirley, seven miles in length. Because of the peculiar conditions surrounding its use, the aerial tram, however, is exclusively a plant facility rather than a form of commercial trans-

portation—hence it may be dismissed without further comment.

Tunnels for the transportation of ore from the lower levels of groups of mines were peculiar to some of the mining districts. A notable one of these was the Yak Tunnel in California Gulch at Leadville, started in 1886 as the Cord Tunnel. It was not completed to its full length of $4\frac{1}{2}$ miles until 1910. Another such was the Cowenhoven Tunnel at Aspen, started in 1890 and completed to a length of $2\frac{1}{2}$ miles in 1901. In 1904 there were five companies taking out ore from their mines through this tunnel. A third, and perhaps the most notable example of this subterranean transportation is to be found in the Newhouse Tunnel at Idaho Springs, which was designed principally to serve the mines at Central City. The tunnel has a section twelve feet square, and is equipped with a double track electrically operated railroad. Construction was started in 1891, and by 1902 the tunnel had been driven into the mountain from the Idaho Springs side for a distance of $2\frac{1}{2}$ miles. In 1910 it was completed with a total length of 4.17 miles.

THE INTERURBANS

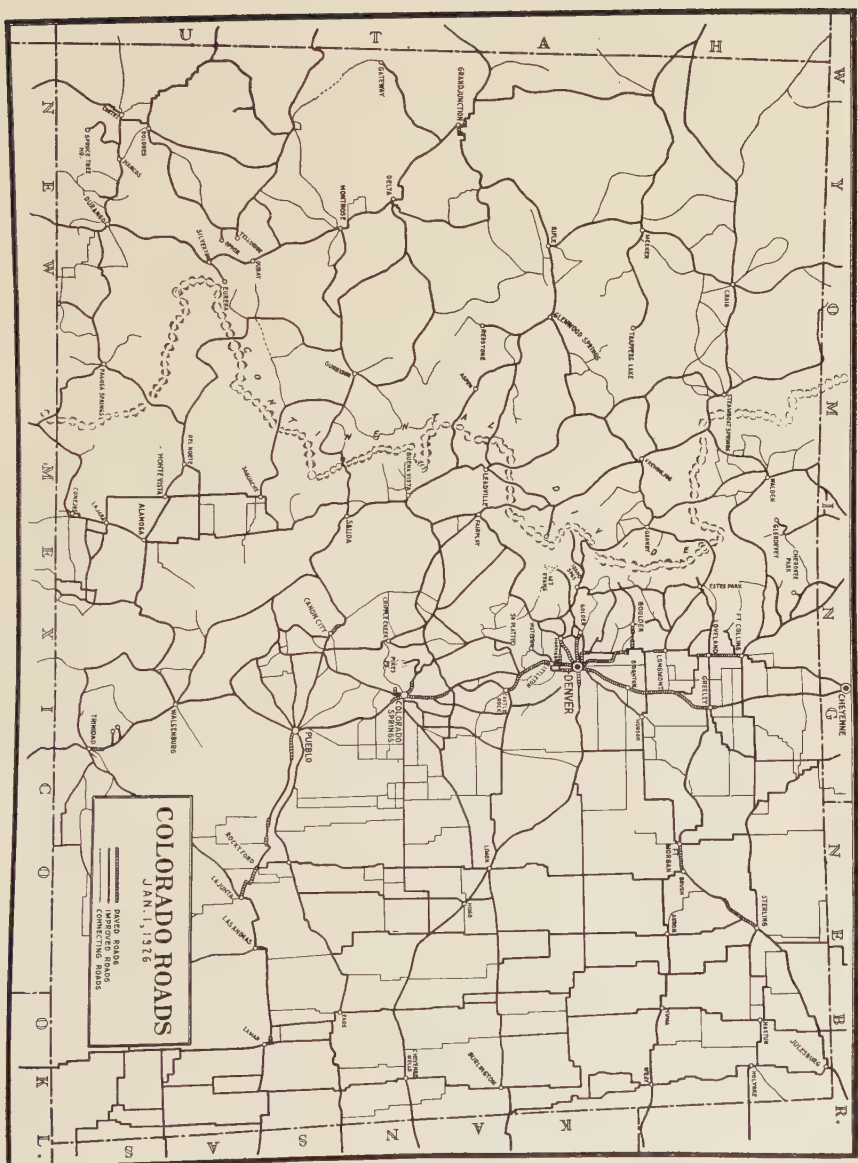
As early as 1890 interurban electric service was inaugurated from Colorado Springs through Colorado City to Manitou. It was not, however, exclusively interurban service in the strictest sense of the word, for it was accomplished in connection with street railway urban service. The Denver, Lakewood & Golden was put into service with electric operation in 1893 to Barnum, and to Golden in 1894, with steam operation beyond Barnum Junction. It was later electrified throughout its length. The Denver & Northwestern Railway Company was incorporated in 1901, and two years later was ready to serve Arvada, Leyden, and Golden in connection with the Denver Tramway. The Trinidad Electric was completed in 1904 to Jensen, Sopris, and Starkville, and later to Cokedale. The last of the interurbans to be constructed was the Grand Junction & Grand Valley Railway, which was put into operation between Grand Junction and Fruita in 1910.

THE AUTOMOBILE

Owing to the absence of authentic record, the date of arrival of the first automotive vehicle in Colorado is obscure. If it is fixed at the beginning of the twentieth century, or in 1900, the probable error cannot be more than a few months at most. The first car was an electric. This was followed shortly by a steamer, and then by a gasoline car. By 1902 there were sufficient motor car owners for the formation of automobile clubs. Here was an entirely new mode of transportation. Railway vehicles were rigidly confined to previously constructed tracks, but automotive vehicles could go anywhere, provided only there be a supporting surface. The rapid increase in number of automotive vehicles and their remarkable improvement as to control, speed, and reliability demanded a character of road entirely different from the ordinary rural highway. While at first the automobile travel was largely confined to cities, it soon spread all over the country, and the counties of the state, previously clothed with road authority and jurisdiction, were no longer able to cope with the condition. Nominally there was at the coming of the automobile a considerable mileage of roads such as they were, yet the ease with which long distances could be covered by the motor car required new routes and an entirely different system of highways. Like the bicycle fad of the '90s, when everybody rode a wheel, automobiles were individually owned and operated, and so large a proportion of the citizenship utilized this mode of travel that highway construction and maintenance became a matter not only of general public interest, but of national and state jurisdiction.

The Colorado Good Roads Association was formed in 1905, and in the 1907 session of the State Legislature a bill was introduced for the creation of a state highway commission, but it failed of passage. It was not until 1913 that adequate road legislation was effected for the construction and improvement of state roads. The national act providing for Federal aid in road building was passed in 1916, amended in 1919, and again amended in 1921. In addition to lending aid to the state in construction of roads, the National Government proceeded to construct roads at Fed-

COLORADO ROADS (JANUARY 1, 1926)



eral expense into the national forests and the national parks, of which there are large areas in Colorado. Likewise, the City and County of Denver both improved already existing roads and constructed new routes in the city system of mountain parks.

Automobiles had by this time become so numerous as to have an influence on the passenger traffic of railroads; in fact, the peak of rail passenger traffic was reached in 1910, and thereafter the number of passengers carried has shown a gradual decline. While the use of the automobile greatly affected rail travel, the influence was largely the result of individually owned and operated cars, and it is only within the last few years that the commercial inter-urban transportation of passengers over the highways has been attempted, and very recently the transportation of freight by automobile trucks between communities has had an appreciable effect on rail freight revenues. The first bus line permit for the carriage of freight and passengers was issued in 1919 by the Colorado Public Utilities Commission for a route between Denver and Boulder. Shortly after the close of the year 1925 there were extant nearly fifty passenger and freight line permits for operation over about 1,700 miles of improved roads. In 1914, the first year of authentic records, there were 1,192 miles of improved and 38,588 miles of unimproved roads in the state, and by the close of 1925 this mileage had changed to 8,600 miles of improved and 59,239 miles of unimproved roads.

With the combined coöperation of all agencies engaged in road building program, improved roads resulted along routes of history and over famous passes such as Berthoud, Frémont, Tennessee, Hagerman, Monarch, Poncha, Sangre de Cristo, and by no means the least interesting, Wolf Creek Pass in the region where one of the expeditions of Frémont came to such a disastrous end. The historic Ouray-Red Mountain toll road of Otto Mears was reconstructed into what is perhaps the premier of all high mountain automobile highways.

It is a singular fact that while for many years there had not been in operation as such a toll road in the State of Colorado, all of them having long since been taken over by the counties, there now came into the scene some very

remarkable privately owned toll roads. Perhaps the most notable of these is the Pike's Peak automobile road constructed from Cascade, on the Ute Pass highway, to the top of Pike's Peak by A. E. Carlton and associates. Another is the Corley highway, resulting from the purchase by W. D. Corley of the Colorado Springs & Cripple Creek District Railway (the Cripple Creek Short Line) in 1922 and its conversion into an automobile highway. Still another is the Cheyenne Mountain road, built in 1925 from Broadmoor, zig-zagging along the face of Cheyenne Mountain to its summit.

PEAK IN RAILROAD MILEAGE

In common with railroads elsewhere in the country, Colorado lines during the last decade and a half have encountered conditions not to be anticipated from their previous history. To the prosecution of the Great War and the necessary adjustment of economic conditions after its termination may be attributed the pronounced change in their life line. For the first few years of this period the total mileage of railroads within the state grew slowly towards the maximum of history in 1914, then described a decline by varying small amounts through the years until 1920, when the rate of decrease became more pronounced. The increase may be partially accounted for through various small increments in the agricultural districts of Northern Colorado, in the Arkansas Valley, and in the Southern Colorado coal fields. The remainder is made up of distinct projects.

In 1911 the Laramie, Hahn's Peak & Pacific Railway, later the Colorado, Wyoming & Eastern Railway, still later the Northern Colorado & Eastern Railroad, and finally the Laramie, North Park & Western Railway, extended its road southward from the Colorado-Wyoming border to Coalmont, in North Park. The same year the Colorado & Southern and the Denver & Rio Grande joined in constructing a double track line over Graneros Plateau from Pueblo to Walsenburg to be used in lieu of the Rio Grande's original track, over which the Colorado & Southern had



TRANSPORTATION AGENCIES

Concord Coach, Motor Bus, Modern Railway Engine

exercised trackage rights for many years. As has been previously mentioned, the Denver & Salt Lake (Moffat road) was extended from Steamboat Springs to Craig in 1913. It was also in 1913 that the San Luis Central was constructed from Monte Vista to Center, in the San Luis Valley. As for the decreases, it may be said that they consist substantially of detached lines, various small branches, and parts of railroads which were unused for lack of traffic or by the intensified utilization of other routes. The largest wholesale reduction of mileage occurred in the dismantling of the Colorado Midland, the Colorado Springs & Cripple Creek District, the Florence & Cripple Creek, the Blue River branch of the Denver & Rio Grande, the Silverton Railroad, and the part of the original Denver & New Orleans between Falcon and Pueblo.

THE MOFFAT TUNNEL

Mention has heretofore been made of the public concern in the construction of the Denver, Northwestern & Pacific Railway, which was started in 1902. The citizens of Denver in 1913 adopted a charter amendment providing for the creation of a Moffat Tunnel Commission composed of three prominent citizens who negotiated a contract with the Denver & Salt Lake Railroad Company (formerly the Denver, Northwestern & Pacific Railway Company) for the construction of a tunnel jointly by the parties to the agreement. This contract, carrying with it provision for a city bond issue of \$3,000,000, was ratified by the citizen property owners in February, 1914, and two months later the bond issue was declared invalid by the Colorado Supreme Court on the grounds that the lending of municipal credit to private enterprise was prohibited by the state constitution. At the November election of 1920 there was submitted to the electors of the state and defeated thereby a tri-tunnel plan providing for a state bond issue of \$18,550,000 to construct contemporaneously and thereafter own three tunnels through the mountains, one near James Peak accessible to the Denver & Salt Lake, a second at Monarch Pass, and a third at Cumbres Pass, or Wolf Creek Pass. A special session of the Legislature convened for

the consideration of Pueblo flood control and Moffat Tunnel legislation in April, 1922, passed acts creating both the Pueblo Conservancy District and the Moffat Tunnel District. The tunnel act provided for a tunnel commission of five members to manage and direct the driving of a transportation tunnel through the Continental Divide between the headwaters of South Boulder Creek and Frazier River at an elevation of 9,200 feet, to negotiate contracts for its use, and arrange for the extinguishment of its cost of construction, for which a bond issue of \$6,720,000 was authorized. A suit to enjoin the commission from the issuance of any of the bond authorization was lost in the District Court, and the constitutionality of the Moffat Tunnel District later upheld by both the Colorado and the United States Supreme courts. Construction by the pioneer method of a tunnel 6.09 miles in length, the shortest length practicable at an elevation of 9,200 feet, was started on August 25, 1923, and at present, August 1, 1926, it is still in progress.

COMMERCE OF COLORADO

The history of rail transportation in Colorado is succinctly and at once comprehensively told in the growth of line mileage from the start in 1870 to a maximum of 5,739 miles in 1914, and thereafter a decline to 5,072 miles in 1925, of which there were 1,198 miles of narrow gage and 3,874 miles of standard gage track. The development of appurtenant facilities and equipment, always abreast of the mileage in its period of expansion, continued with unabated progress even though recent conditions have brought about a diminution in aggregate length of lines, so that at present the state is far better supplied with rail transportation than ever before. The many difficulties, financial, industrial, and social, which beset the carriers may be read in their wavering and even at times halting march of progress.

No private enterprise has ever contributed more toward the prosperity of a commonwealth than has the Denver & Rio Grande, and in its history and character is reflected Colorado's progress. For the fifty-four years of operation the several major classes of freight moved have adhered

with phenomenal uniformity to the following mean proportions:

Products of Mines	69%
Products of Forests	9%
Products of Agriculture	6%
Products of Animals	2%
Manufactures and Miscellaneous	14%

Neglecting the first nine years of the formation period and adopting the last forty-five years as being more truly representative, the character of Colorado commerce may be stated thus:

Mines	75%
Agriculture	5%
Forests	4%
Animals	2%
Manufactures	14%

The pack animal, the ox car, the freight wagon, the stage, the railroad, and the automotive vehicle, each in its own sphere and period, has had a share in developing the Crest of the Continent with its still unmeasured resources.

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